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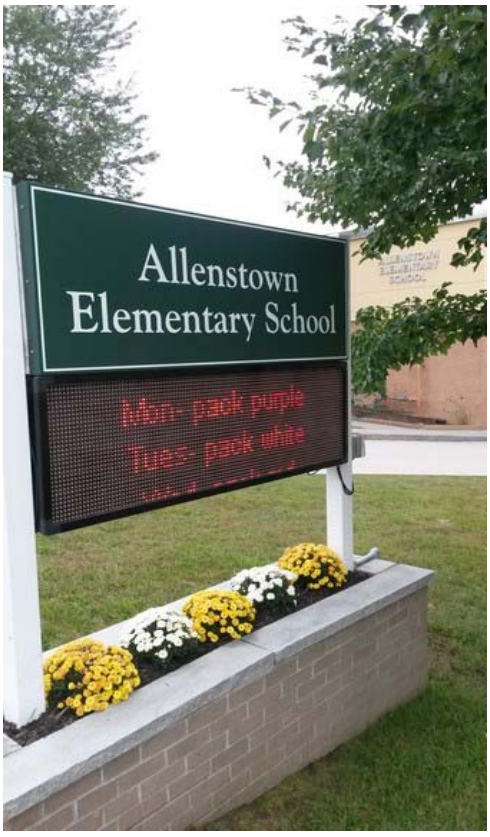
ALLENSTOWN SCHOOL DISTRICT
ALLENSTOWN ELEMENTARY SCHOOL
Allenstown, NH 03275
PROJECT # 18345

NOVEMBER 19, 2018
Revised MARCH 11, 2019

FACILITY ANALYSIS



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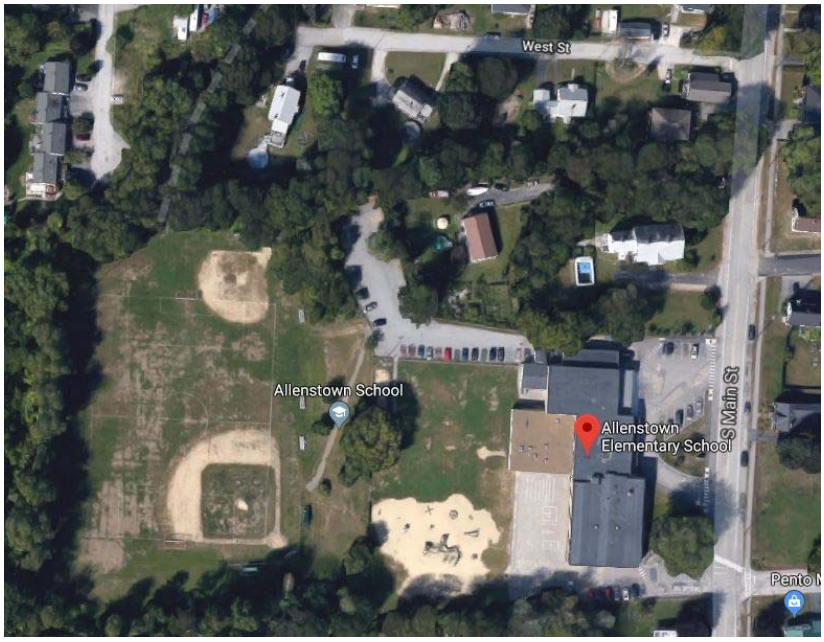
INTRODUCTION AND OVERVIEW

General

Harriman of Portsmouth, New Hampshire was retained by the Allenstown School District to prepare a facility analysis of the Elementary School and Armand R. Dupont Middle School in Allenstown, New Hampshire. The intent of this analysis is to evaluate the condition of the existing building and systems, to identify necessary upgrades as required by current applicable codes and standards to reuse the existing facility, and to evaluate the possibility of combining the two schools into one building. This report is to aid in understanding the current condition of the entire facility in order to help facilitate the decision making process as to what possible renovations and/or additions may be required.

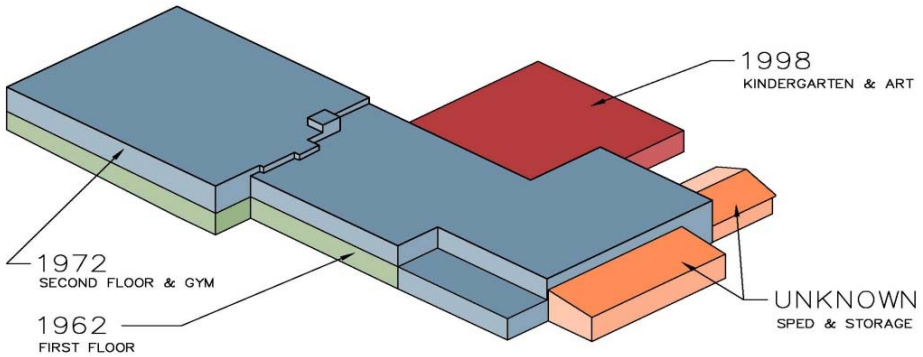
The narrative that follows is based on observations made during site visits in August of 2018 by Harriman's architects, civil, mechanical, electrical, and structural engineers. No destructive investigation was conducted during the site visits other than the removal of ceiling tiles and access panels from mechanical spaces.



ALLENSTOWN ELEMENTARY SCHOOL - FACILITY ANALYSIS

Note: The three parcels (212, 224 & 237) totaling 14.96 acres are owned by the Allenstown School District. Only parcel 212 (6.1 acres) is considered buildable.

YEAR BUILT	FIRST FLOOR	SECOND FLOOR	TOTAL SF
Original 1962	11,900	0	11,900
1972	4,950	11,900	16,850
1998	4,700	0	4,700
Unknown (Storage)	1,260	0	1,260
Unknown (SPED)	730	0	730
Totals	23,540	11,900	**35,440**



ALLENSTOWN ELEMENTARY SCHOOL - FACILITY ANALYSIS

Historical Perspective

The original one story building was completed in 1962. In 1972 the second floor addition was built, including the multipurpose/gym. A third one story addition was built in 1998. In 1972 the elevator was added.

Grade configuration is presently Preschool, Kindergarten and grades 1 through 4, instructed in 12 classrooms (1 through 4) and 3 classrooms (Preschool and Kindergarten), totaling 15 classrooms.

Current enrollment is 195 students with a total staff of 48, which includes 11 teachers.

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ALLENSTOWN ELEMENTARY SCHOOL - FACILITY ANALYSIS

EXECUTIVE SUMMARY

General

The Allenstown Elementary School facility is comprised of three different construction areas. The original the 1962 brick building was built as a one story school. The new school had six classrooms, an activity room, principal's room, teachers' room and a nurses and kiddie's room. It was built at a cost of about $170,500 on Main Street at the site of the former Sullivan estate, owned by the late Grace Marston. She was a former teacher and served on the school board for 24 years.

In 1972 additions were built that included the second floors classrooms and Library over the administration area and classrooms above the first floor classrooms after the short stairs up in the corridor. Also included was the Multipurpose, one story area (OT/PT, Sped, PE Office and Storage) in the front right side of the main entrance and the elevator.

In 1998 an addition was built to include one story for the Kindergarten classrooms, Art room and support space.

The School District currently services K-4 with 195 students and a total staff of 48, which includes 11 teachers. *Note: Refer to Attachments for Existing Floor Plans.*

Building Life Expectancy

To determine the life expectancy of the buildings, data has been taken from Article 3.2.7, Commercial Building Median Lifetimes (Years), from the Building Energy Data Book, dated March 2012, Source(s) EIA. Below are four building types and the years of building survival rate:

	Median (1)	66% Survival (2)	33% Survival (2)
Education:	62	45	86
Assembly:	55	40	75
Small Office:	58	41	82
Food Service:	50	35	71

Notes:

1. PNNL estimates the Median lifetime of Education buildings is 62 years.
2. Number of years after which the building survives. For example, a third (33%) of the Education buildings constructed today will survive for 86 years.

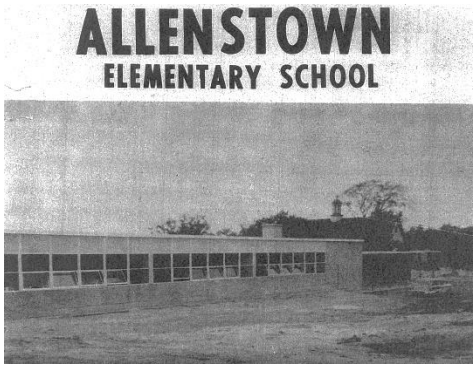
Original 1962 Building, 1972 Additions, and 1998 Additions

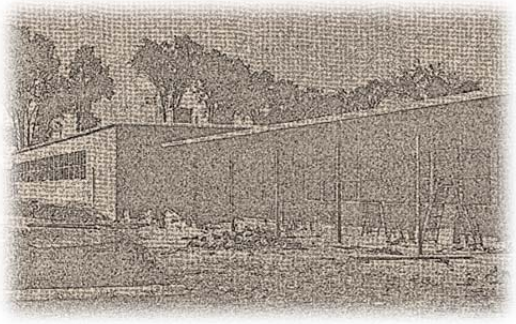
The original structure is over 55 years old and building shell appears to be in fair to good condition. Building codes in 1959 were just being introduced and followed. Many of the codes have been updated and the school district shows evidence of updating where feasible. This report outlines many building code and handicap accessibility issues; many of the systems and equipment have also outlived their life expectancy. These are significant indicators that the original 1962 facility and the 1972 addition are due for some major upgrades.

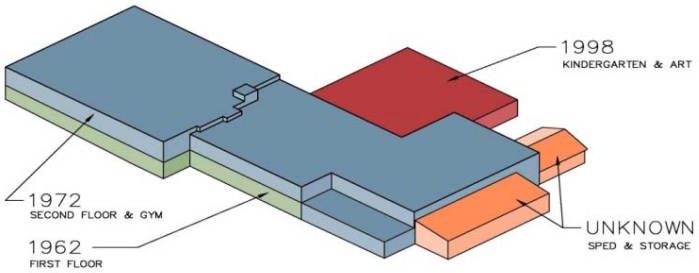
ALLENSTOWN ELEMENTARY SCHOOL - FACILITY ANALYSIS

The 1998 building shell appears to be in fair to good condition. The two wood structures for Storage and SPED are of unknown date and are in poor condition, not consistent with school type of construction.

Note: Building codes are typically updated every three years with a new edition. The State of New Hampshire is presently enforcing the 2009 IBC codes. The NH Building Code Review Board is now reviewing the 2015 IBC codes, which are most likely to be adopted by the state within a next year. Over time, we have seen newer editions increase design loads. Please note that the applicable code takes effect at the time of obtaining a building permit. By waiting, codes will eventually change and may require additional upgrades to the structure and building systems.







Site

If no additions are added, the elementary school site does not require many repairs.

- Repair damage surrounding the catch basin located along northern access way;
- Monitor pavement damage alongside the north-facing exterior wall at the gymnasium; and
- Reseed the grassed areas around the perimeter of the play area.

Architectural and Codes

- Exterior Walls: If a renovation is to take place, the Energy Code (IEEC) will need to be adhered to. Apply metal stud furring to exterior walls with spray foam insulation to seal the perimeter of the envelope and a layer of gypsum dry wall.

By not taking on a major renovation project, IEEC does not apply.

- Replace wood additions (Storage and SPED) with non-combustible construction.

- Replace all carpeted areas with new carpet or alternative floor materials.
- Multipurpose to provide seamless sport floor.
- Replace suspended acoustical ceiling tile throughout due to most areas being in fair to poor conditions.
- Plaster ceilings to be patched and painted.
- Add sound absorbing ceiling at Multipurpose.
- Remove and replace exterior windows with commercial grade thermally broken frames.
- Kitchen plan for the future.
- Provide Kitchen with an office to secure cash and files.
- Provide Kitchen with ADA accessible staff toilet.
- Reviewed with Integration/Data Specialist to update with LCD projector with white boards.
- All casework to be replaced.
- All exterior and interior doors to be replaced with new doors, frames, sidelights, transom, and hardware. Reduce view windows to classrooms and classroom security functions hardware.
- Consider providing a fully automatic sprinkler system.
- Interior stairs to be updated to meet code requirements regarding handrails, guardrails, fire rating enclosures.
- Exterior stairs to be replaced.
- Toilet rooms in the 1962 and 1972 to be updated to meet ADA code requirements. Some may be technically infeasible and will require waiting for a major renovation or addition project.
- Issue with Multipurpose room EXIT through Vestibule 139.

Structural

Further detailed and specific analysis would be necessary to evaluate the impact and develop necessary reinforcements. Renovations and/or additions if being considered whereby upgrades will impact the existing structure. The major upgrade is to the mechanical system, including adding roof top units on the existing roof.

Fire Protection

- There is no sprinkler system in the Allenstown Elementary School. If an addition is to be added or significant renovations were to occur, a fully automatic sprinkler system would be required. The existing 2” water service entrance could not support a sprinkler system and a new 6” minimum water entrance may be needed.
- Conduct a street hydrant flow test to confirm the water supply flow and pressure.
- Confirm that the residual pressure meets the pressure demand on the system.

Plumbing

- The indirect fired water heater should be removed and replaced with a high efficiency gas fired stand-alone water heater. The water heater would provide hot water year-round.
- Replaced all restroom plumbing fixtures with water conserving models with new flush

valves and faucets. Refer to Architectural section.

- Replace all classroom sinks with ADA child height fixtures. Mount the counters and sinks at 31" above finished floor with knee space below. If bubblers are needed they need to be in a separate sink. Refer to Architectural section for casework.
- In the single user restroom in each Pre-K and Kindergarten classroom provide fixtures mounted with the toilet seat height at 15" and the lavatory at 31" above finished floor.

Mechanical

- The school lacks proper ventilation that meets current ASHRAE 62.1-2016. Recommend providing a dedicated outdoor air system (DOAS) to provide 100 percent outdoor air.
- The boiler plant is at capacity or near maximum capacity to heat the building. The system lacks redundancy. The remaining boiler may struggle to heat the building on a design heating day when average temperatures are at their lowest. The addition of any ventilation systems would add to the heating demand on the school. Any plans for future expansion would also exceed the capacity of the existing boiler plant. At a minimum, a third boiler should be added to provide some redundancy.
- Pipes that are uninsulated in the boiler room should be insulated with PVC covers.
- A ductless split air conditioning unit should be provided for the data room.
- If cooling is desired for the entire school, then rooms such as classrooms and smaller should be connected to a central variable refrigerant flow system. If large spaces are to be cooled such as the multi-purpose room, a central air handler should be size with heating and cooling coils to provide heating, cooling, and ventilation.
- At a minimum, the kitchen hood exhaust ducts should be replaced and installed in accordance with NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- Pneumatic controls should be removed and replaced with direct digital controls which allow users to access a graphical user interface from any location with the proper credentials.

Electrical

- Presently the peak demand shows available capacity on the Utility side of the service. However, the service is not adequate to accommodate the additional ventilation requirements of the building once renovated.
- In order to accommodate a renovation, the service will be required to be increased in capacity. An 800 amp service at 208V volt, three phase will be required. The upgraded service will require floor space be taken from another location in the building.
- Due to the size of the existing space and location of the communications rack, there is not enough space to accommodate a new service in the existing location. A re-design of the area will be required.
- The service entrance disconnect should be locked shut to keep unauthorized people from opening the switch and exposing themselves to the energized components of the switch.
- Code required working clearances do not exist. Either the electrical equipment or communications equipment will have to be relocated.
- If the electrical service is upgraded and relocated, this room can remain as a

communications room. Cooling of the room should be provided.

- Circuits should be traced to update panelboard directories with accurate, legible, typed directory cards.
- Panelboards that are 30 years old or older should be considered for replacement. Expected useful life expectancy is around 30 years.
- Panelboards with incorrect circuit breakers (kitchen panelboard) should be replaced for safety reasons.
- Remove lighting fixtures that are no longer in use and run through walls.
- Upgrade lighting with LED for both interior and exterior lighting fixtures.
- LED lighting fixtures with dimming in office and classroom
- Energy codes require automatic lighting control for most lighting fixtures. Use low-voltage lighting control, local occupancy sensing controls in rooms
- Replace existing emergency egress / life-safety lighting battery units with new.
- Battery unit to be powered from local lighting circuit to meet code.
- Provide denser spacing to provide the code required lighting levels and redundancy.
- Replace the existing fire alarm system with voice evacuation throughout the building.
- Provide notification in classrooms.
- Provide smoke detection to comply with code.
- Replace existing exit signs and add signs where required; relocate as necessary.
- Provide LED exit signs for reduced maintenance and evenly illuminated face.
- Maintain and upgrade sound reinforcement systems in all teaching spaces.
- Add interactive teaching devices to any space that does not currently have any; upgrade oldest devices.
- CCTY review coverage, re-aim cameras as/if needed for better coverage, add cameras as/if needed.

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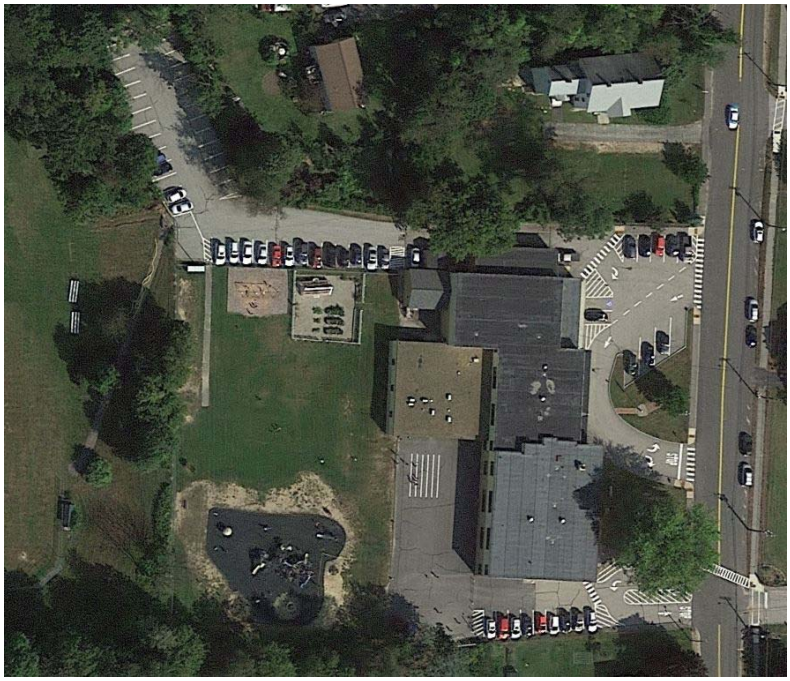
ALLENSTOWN ELEMENTARY SCHOOL – FACILITY ANALYSIS

SITE

General

Evaluation of the site at Allenstown Elementary School involved walking around the school and the grounds, making observations of existing site features. Photographs were taken to document these existing conditions. The goal of the study is to look for deficiencies and to gather relevant information on the conditions of the site. Included is an evaluation of the surface drainage and associated infrastructure, evidence of erosion from stormwater runoff, and existing site circulation and parking, including observations associated with Americans with Disabilities Act (ADA) access from the adjacent streets and the parking areas to the building.

Existing Conditions



Google Earth Image: Dated September 11, 2017

The Allenstown Elementary School is located on a site that is approximately 6.1 acres in size. Site topography gradually slopes from east to west throughout the site. Pavement surfaces generally surround the building, with minor exceptions to the east (area between bus and student drop-off) and to the west (playfield area). The majority of the parking is located to the northwest of the building, including a paved lot adjacent to the ball fields and greenhouse area, which is slightly lower in elevation than the school building. This parking area can be accessed via the northern entrance (bus loop area) and proceeding west along the northern side of the building. The pavement in this area is generally in fair condition. However, along the northern building edge of the gymnasium, the pavement does have some damage, including potholes and various areas of differential settlement. There is also an existing catch basin located in the middle of the access way between the bus loop and parking area that has some surrounding pavement damage.


Cracking and differential settlement at north building edge


Settlement/sediments surrounding existing catch basin

Upon entering the bus loop off of S Main Street, there are eleven parking spaces that make up the lot area. The bus loop proceeds as a one-way southwesterly towards the main entrance and then exits to back out to S Main Street with turning lanes in each direction. The pavement within this area is generally in great condition and the pavement markings (parking spaces, ADA, crosswalks, arrows) are clearly defined. Similar observations were made at the parent drop-off and associated perimeter parking area, which is located south of the school and bus loop. Through this entrance, parents are able to enter off of S Main Street, drop off their children, and make a U-turn to exit back onto S Main Street. The pavement and paint markings are in great condition and the bollards appear to be new. Paint markings and posted signage guide the drivers to complete the U-turn and drop-off the children.


Bus loop paint and pavement in great condition


Parent drop-off paint and bollards in great condition

There is another paved area located to the southwest of the building, which is primarily used as a hardscape playground area, including a basketball goal. There is also a dumpster located in the southwest corner of the area. This pavement is generally in good condition. The bituminous curbing located along the western side of the pavement is in good condition and appears to function properly, as it drains all stormwater towards the existing catch basins.

Additional play areas for the students are located to the west of this hardscape. There is a sizeable grassed field, a swing set, and playground area. The playground appears to have an engineered rubber mulch surface and includes numerous slides, monkey-bars, and climbing

apparatus. The perimeter of the rubber mulch surface is contained by plastic interlocking segments that separate the mulch from the surrounding existing vegetation. In the immediate surrounding of the mulch, the vegetative growth is sparse, likely due to the high-volume of students playing in the area. The vegetative growth outside of this area is in good condition and appears to be well-maintained.

Existing playground area

Existing vegetative area at playground area

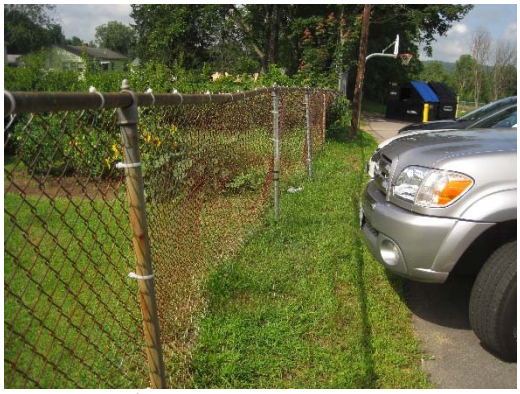
In general, and throughout the pavement surfaces on the site, the drainage structures appear to be maintained and are in good condition. In some areas, like described above and within the vicinity of the main entrance, observations of sediment were noted. Pavement generally drains away from the building with observed catch basins being noted at the main entrance (center of the bus loop), in two locations along the northern access road, and in the southwestern portion of the site, adjacent to the dumpsters and basketball goal.

Existing catch basin outside of main entrance

Existing catch basin near dumpster and basketball goal

Harriman did not observe any catch basins or drainage infrastructure within the playfield area.

Other observations made during the site visit included perimeter fencing, signage, and ADA accessibility throughout the site. The perimeter fencing was mostly in good condition, including some fencing that appeared to be relatively new. The only area fencing was observed to have some minor damage was along the southern perimeter where the fencing appeared to have been hit by a vehicle.



Damaged/rusted fence at southern perimeter

Northern perimeter fence in great condition

Adequate and proper signage appears to be installed throughout the site. Stop signs are installed at each exit lane (two at the bus loop for each turn lane, one at the parent drop-off), while "Do Not Enter" signs are posted in the opposite direction of traffic flow at the exit and entrance to the bus loop. Additional signage noted included ADA signage, "no parking" (within bus loop and along S Main Street), reserved parking spaces for staff, pedestrian crossing, and student drop-off area signage.

Existing signage along S Main Street

Existing stop signs at bus loop exit

The ADA accessibility for circulating throughout the site also appeared to be sufficient. Along S Main Street, maneuvering onto and off of the existing sidewalks is accessible via ramps and detectable warning plates. Additional ramps and detectable warning plates were observed along internal circulation routes as shown below. All warning plates appear to be rusting, but are still considered to be in fair condition. The playfield area is also accessible via a paved walk that is located off of the northwestern parking lot.

ADA ramps and detectable warning plates


Accessible walkway into the playfield area

Recommendations

Harriman understands that the School District's intent is to consolidate the two local schools (Allenstown Elementary and Armand J. Dupont Middle Schools) into one site. Based upon this understanding, the Allenstown Elementary School site would be preferable because the existing site at the elementary school (6.1 acres) is more than double the size of the site at Armand J. Dupont (2.5 acres). The elementary school also has more surrounding land potentially available for required expansion per Ed 321.03: Minimum Standards for School Sites. The School District owns two additional abutting properties, which total 14.96 acres when combined. Please refer to Introduction section for adjoining properties.

If the two schools are to be consolidated into one facility, it is required that the school's minimum site size shall be 10 acres of contiguous buildable land for a middle school (design capacity is less than 1,000 students), unless the school board requests a waiver for minimum site size under Ed 321.30. Harriman can provide additional consultation on this site work upon receipt of information from the School District as to what is proposed for the two schools.

In general, the elementary school site does not require many repairs. Harriman would recommend that the School District continue with proper maintenance at the facility that includes cleaning all catch basins and their surroundings, upholding the aesthetics of the vegetated areas and playfield, and routinely inspecting the pavement and curbing for damages. Minor site improvements that are recommended include the following:

- Repair damage surrounding the catch basin located along northern access way;
- Monitor pavement damage alongside the north-facing exterior wall at the gymnasium; and
- Reseed the grassed areas around the perimeter of the play area.

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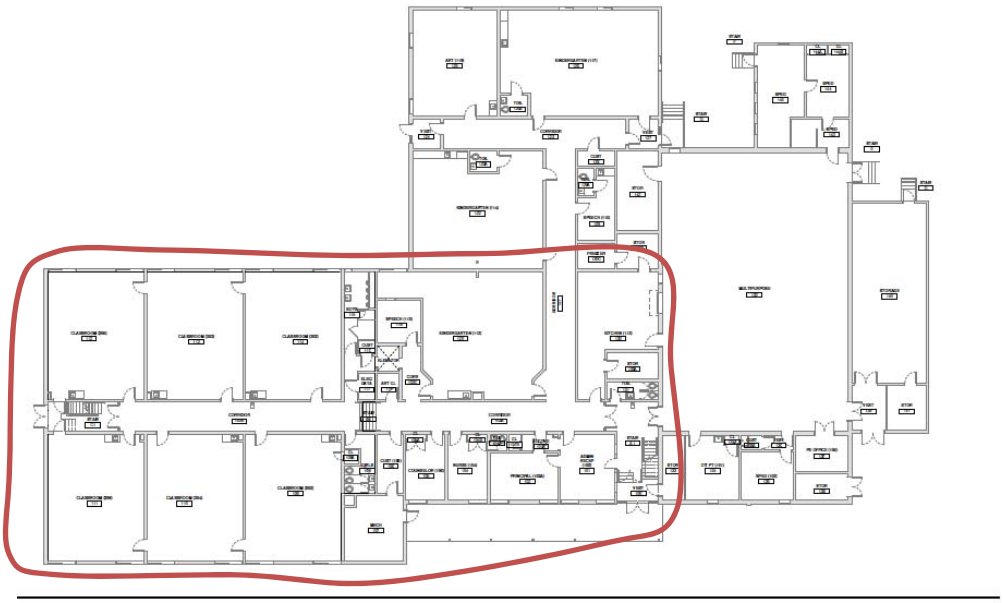
ALLENSTOWN ELEMENTARY SCHOOL – FACILITY ANALYSIS

ARCHITECTURAL AND CODES

Building Shell

Observations - Original 1962 Section

This section is one-story exterior masonry wall with exterior brick. It is unknown if there is insulation in the walls. Based on the era of construction, little to no insulation was used on any of these exterior walls. The brick is in good condition.



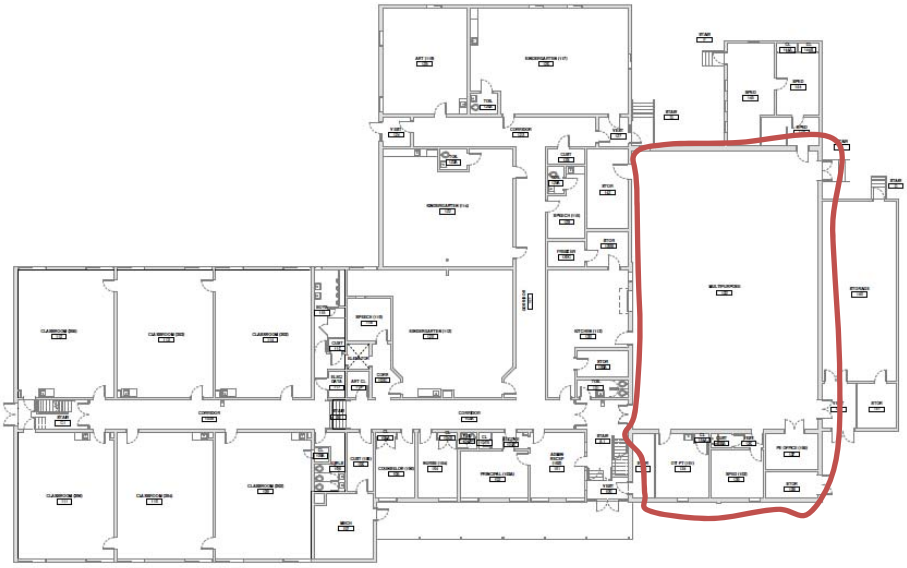
ALLENSTOWN ELEMENTARY SCHOOL

EXISTING FIRST FLOOR PLAN

Observations - Additions 1972

This section includes the second floor classrooms and Library over the administration area as well as the classrooms above the first floor classrooms after the short stairs up in the corridor. Also included is the Multipurpose, one story area (OT/PT, Sped, PE Office and Storage) in the front right side of the main entrance and the elevator. No drawings were available.

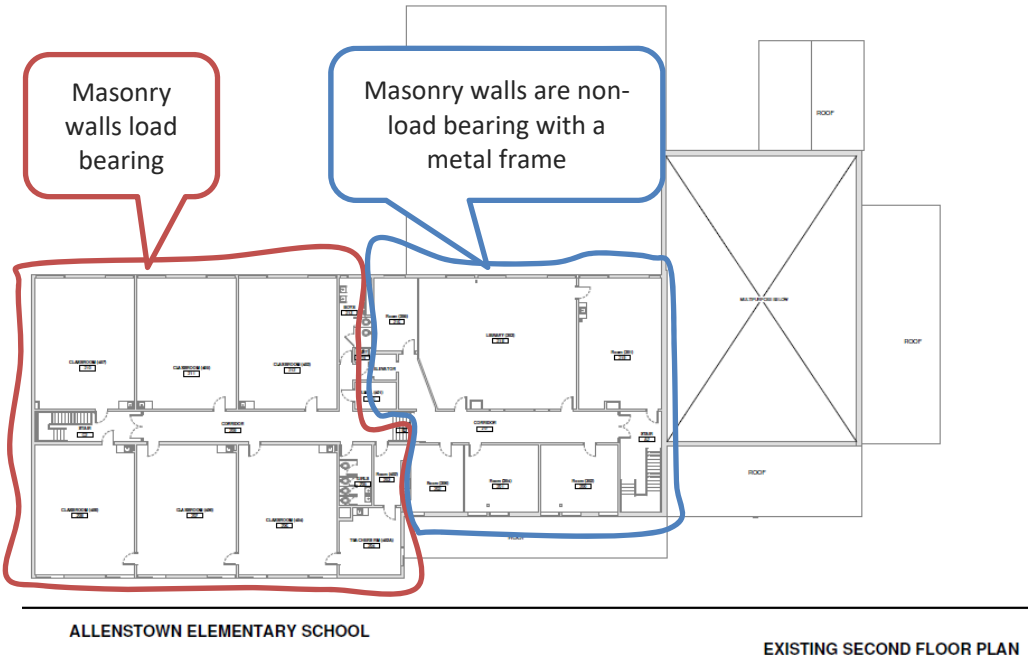
ALLENSTOWN ELEMENTARY SCHOOL – FACILITY ANALYSIS



ALLENSTOWN ELEMENTARY SCHOOL

EXISTING FIRST FLOOR PLAN

The exterior second floor and Multipurpose is a masonry wall with exterior stucco insulated finish system. No documentation was available as to when the stucco finish was applied. We believe stucco finish was applied during this addition and was refurbished at a later date. The second floor was constructed with two different methods: one section is masonry walls load bearing with many interior walls appear to be masonry load bearing. The other section is masonry walls non-load bearing with a metal frame. The Multipurpose section is masonry walls load bearing and roof with open web bar joist. Per our observation, the insulation is Styrofoam with a thickness of 1-1/2 inches. The estimated R-value is approximately R-7.5.



The one story area to the right of the main entrance is a masonry wall with exterior stucco insulated finish system. It is unknown if there is insulation in the walls other than the stucco insulated finish system. Based on the era of construction, little to no insulation was used in the walls on any of these masonry exterior walls.

Stucco finish with exposed 1-1/2 inch Styrofoam insulation

Recommendations - Additions 1972

If a renovation is to take place the Energy Code (IEEC) will need to be adhered to. Harriman recommends furring out exterior walls with wood studs and filling the voids with spray foam insulation to seal the perimeter of the envelope and a layer of gypsum drywall. The cavity would allow for electrical and data wiring with devices.

ALLENSTOWN ELEMENTARY SCHOOL – FACILITY ANALYSIS

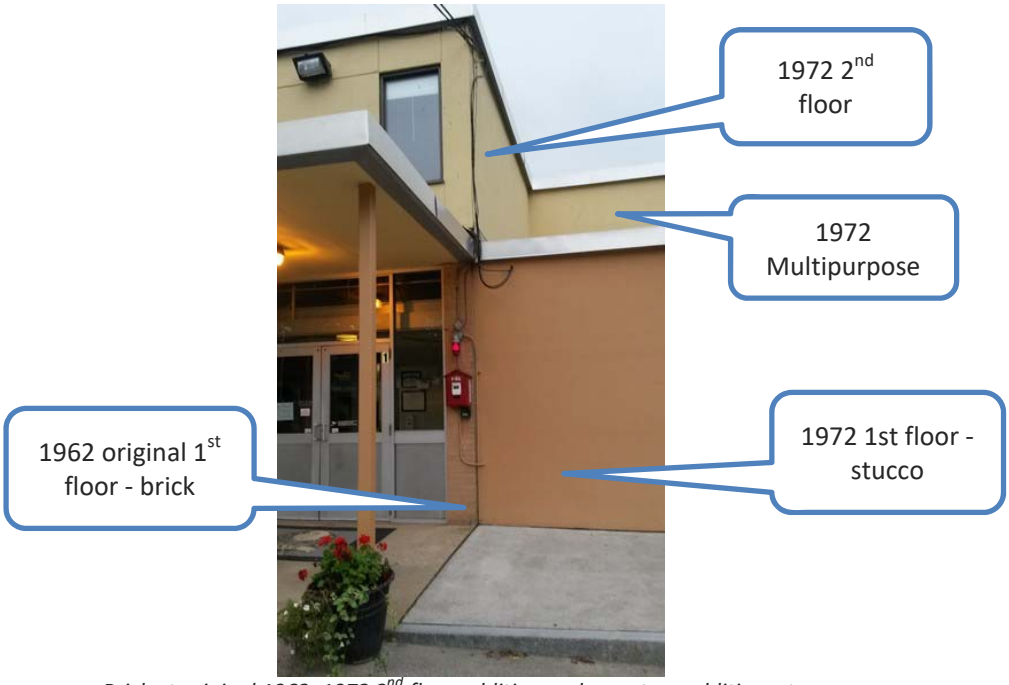
By not taking on a major renovation project, IEEC does not apply. Repointing and ongoing maintenance are recommended to maintain exterior brick walls and to keep moisture from penetrating the building shell.

Front elevation – first story 1962 and second floor 1972 addition

Brick at original building

1972 addition with stucco

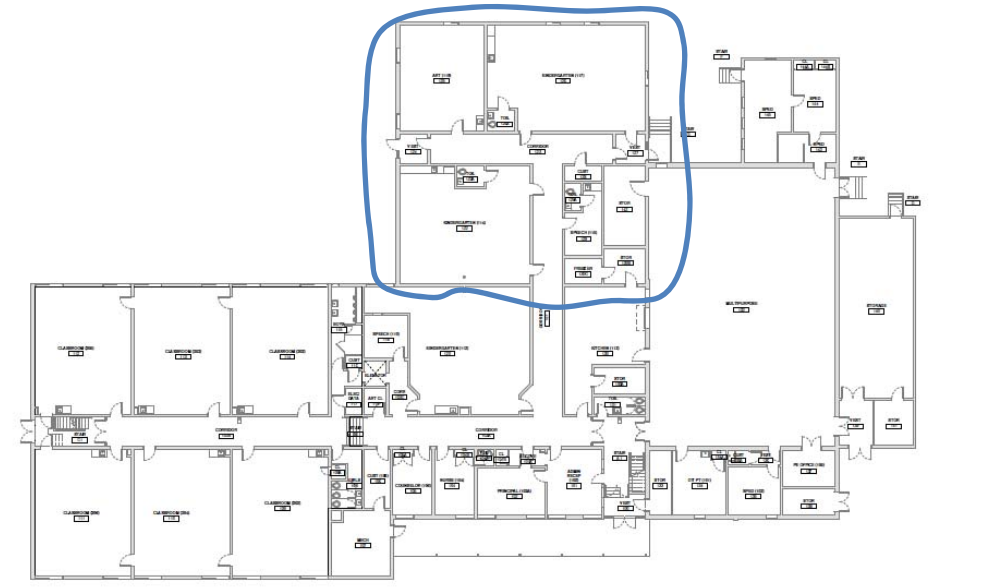
Brick at original - Stucco at 1972 addition



Brick at original 1962, 1972 2nd floor addition and one story addition- stucco

Observations - Addition 1998

This section is one-story exterior masonry wall with exterior stucco insulated finish system. This section includes the Kindergarten classrooms and Art room. No drawings were available.



ALLENSTOWN ELEMENTARY SCHOOL

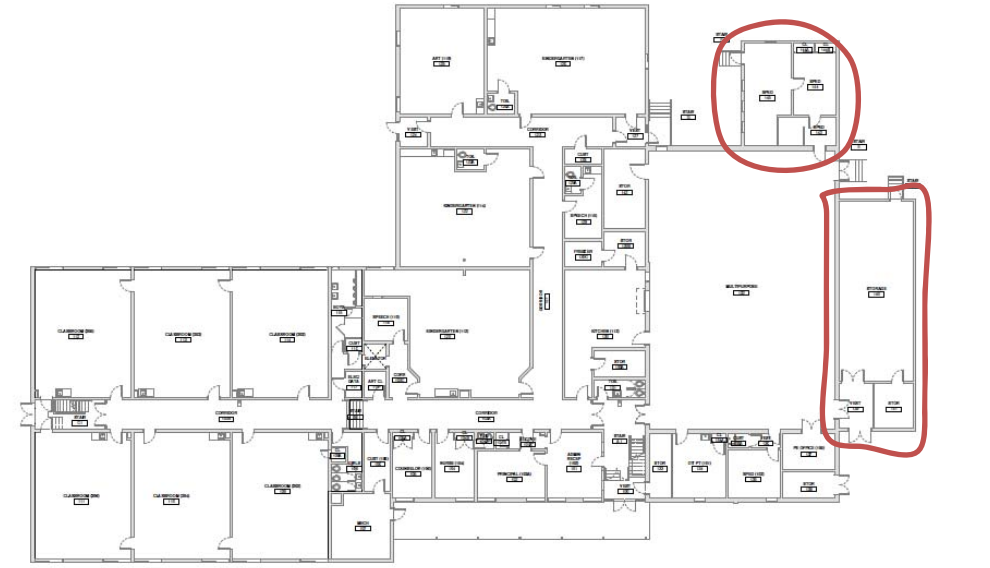
EXISTING FIRST FLOOR PLAN

Rear elevation

Rear elevation - single story Kindergarten and Art 1998 addition

Observations and Recommendations - SPED and Storage Additions

These two additions are wood frame construction and per building code for combustible construction. The original building and other additions are non-combustible construction. Per building code, the criteria when calculating allowable square footage would be based on the code lest protected building type (combustible construction) and if the building as an automatic sprinkler system (this building as no sprinkler system). With an addition or substantial renovations we would not meet the criteria. We would recommend replacing the two additions with non-combustible construction.



ALLENSTOWN ELEMENTARY SCHOOL

EXISTING FIRST FLOOR PLAN

SPED addition

Storage addition

Asbestos Containing Building Materials

Note regarding ACBM: Asbestos containing building materials (ACBM) per AHERA re-inspection report dated June 3, 2016 reported all accessible areas were visually inspected for ACBM. Summary of suspect friable and nonfragile materials identified in Appendix A. Bulk material sampling was performed in Appendix B.

Included in the report the following was noted:

Sampling of materials that tested positive include; pipe insulation, door caulk, spay on ceilings, interior caulk, sink basin mastic.

Inspection did not include inaccessible interior building spaces or exterior building materials. The following are beyond the scope of an AHERA Inspection the following exterior materials and should be assumed to be ACBM; caulking & glazing compounds, roofing, sealants, EIFS siding materials, exterior felt paper materials.

Prior to any renovation or construction work further testing should be taken to verify in accordance with State and federal regulations. Abatement of ACBM should be designed and monitored by a qualified/certified consultant.

Foundation and Floor

General

All floors on the first floor level are concrete slab on-grade. Based on the era of construction, no insulation was used. Very little can be done to add insulation, other than excavating exterior walls down approximately 4 feet and adding 2 to 2-1/2 of rigid insulation. This would not be recommended due to the extensive cost.

Interior Finishes

Floors

The predominant floor finish is vinyl tile. It is throughout the classrooms, SPED areas, Multipurpose, Offices, teacher's area, corridors and storage rooms. Classrooms in the 1998 addition are about one-third vinyl tile at cubbies, with the remaining area being carpet. Carpet was a miss-lot color run and needs to be replaced. Carpet is also installed at the Library and the SPED area by Multipurpose. The Boys and Girls toilet rooms are ceramic tile. There is quarry tile in the Kitchen.

Typical classroom

Typical stair

Typical Preschool/Kindergarten classroom

Multipurpose

Typical toilet

Kitchen

Library

Recommendations

The carpet in many areas it is worn and should be replaced. The vinyl tile, ceramic tile and quarry tile vary in condition.

- Replace all carpeted areas with new carpet or alternative floor materials.
- Multipurpose to provide seamless sport floor.

Walls

The interior finished walls are a mix of painted concrete masonry units (CMU), painted bricks and painted gypsum wall board. The walls are generally in good condition throughout.

CMU wall - running bond coursing

CMU wall - stacked bond coursing

Painted brick

Gypsum wall board

Recommendations

- No action at this time.

Ceilings

There is suspended acoustical ceiling tile throughout most areas of the building. A variety of conditions, from poor to good, were noted. Many ceiling tiles have been discolored and stained.

Plaster ceilings are located at Rooms 112, 202, 203, 204, 205, and 206. The 1972 Multipurpose space is exposed painted acoustic metal decking.

Acoustical ceiling tiles

Plaster ceiling

Exposed structure and deck

Recommendations

- Replace acoustical ceiling tiles.
- Add sound absorbing ceiling system at Multipurpose.

Exterior Windows

Observations

Exterior windows are generally aluminum sliding thermal pane that were replaced in two major window replacement projects. One series were a sliding window with one thermal pane glazing, which are in fair condition. The other series were light weight thermal pane glazing and a second single pane glazing similar to a storm window. They are very difficult to operate and in poor condition. Many of the thermal glazing have lost their seal, evidenced by condensation between the panes of glass. The SPED addition has residential windows.

Thermal pane glazing that lost seal

Typical sliding window

Worn out track

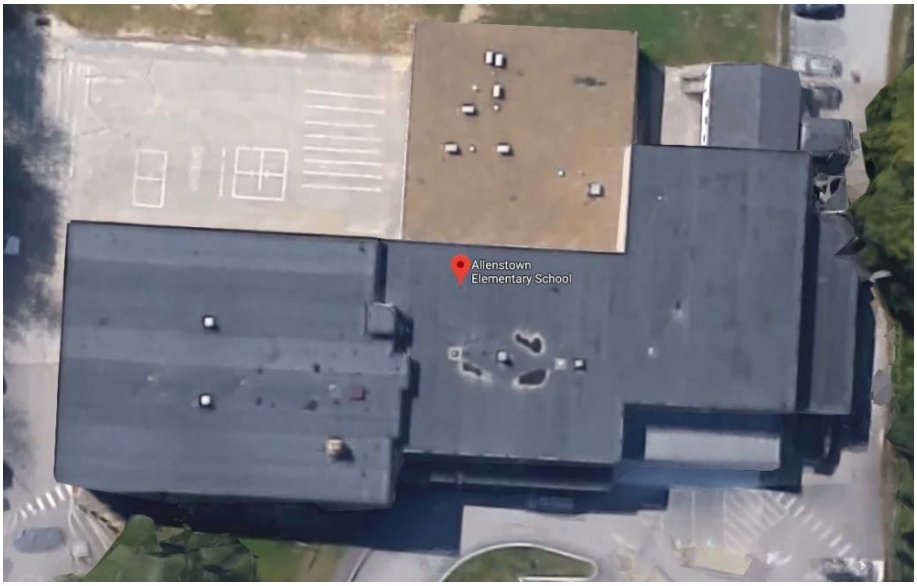
SPED addition - residential windows

Recommendations

- Remove and replace all windows with commercial grade, thermally broken frames, exterior window system.
- System could be a combination of double hung windows or sliding style and fixed windows.
- Windows to be insulated glazing, low-E and argon filled for best performance.

Roofs

Per the school district, the flat roofs were re-roofed approximately 4 to 5 years ago. The thickness of the insulation is unknown. Per the building codes at the time, it would have required an R-20 minimum. Common insulation at the time was polyisocyanurate, approximately 2- ½ inches in thickness.



Recommendations

- No action at this time.

Kitchen Equipment

Observations

The Kitchen is part of the original 1962 building. During the 1972 addition the kitchen serving line flipped to the new Gymnasium, now known has the Multipurpose room. The kitchen space was designed for half of the student population. It is a very cramped space with minimal isle width. Some kitchen equipment is very old and not functioning or being used. The Kitchen does not have direct access from exterior. Deliveries occur through Multipurpose or main entrance. For additional information, refer to the mechanical and plumbing reports.

Recommendations

- Expand the kitchen area to support new equipment and serving line.
- Provide office to secure cash and files.
- Provide ADA accessible staff toilet.

Marker Boards and Tack Boards

Observations

There are a variety of chalkboards, marker boards, and tack boards throughout the building. Some are original to the building and others have been added over the years. The marker boards and tack boards are generally in poor to good condition throughout. Interactive marker boards and

projectors have been added to many rooms with a variety of styles.






Typical marker boards, tack boards and Interactive marker boards /projectors

Recommendations

- Reviewed with Integration/Data Specialist: all classrooms should be provided with LCD projector with white boards. This should be revisited for the latest direction with technology in the school district.

Casework

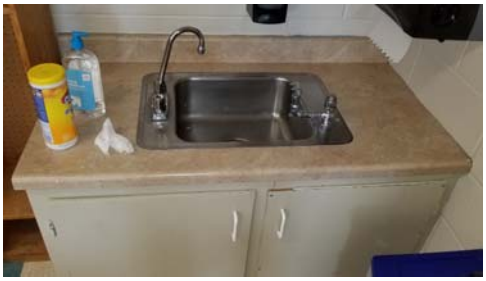
Observations

All built-in casework (cabinetry, cubbies, shelving, etc.) appears to be original to the respective portions of the building. Some of the casework has been modified or added too. Casework in the classrooms and Nurse are is residential grade. Much of the casework is missing parts. Many parts are outdated and no longer available including sinks, faucets and bubblers. Refer to plumbing section. The plastic laminate countertops show signs of significant delamination and have been reported to be repaired several times. A majority do not meet ADA standards. Many countertops are too high and not age appropriate for classroom with steps stools.

Plastic laminate delamination

Residential grade

Bubbler not functioning



Door replaced with plywood


Typical step stools throughout classrooms


Most classroom sinks have bubbler and per code they must have a separate sink to meet hygiene standards

Recommendations

- All casework to be replaced. Consider redesigning with a combination of open and closed cabinets/shelving.
- Most spaces need additional storage space.

Doors and Hardware

Observations

Most classroom doors have half glass, upper viewing glass panel. Per Homeland Security's Physical Security Enhancement Master Plan, doors are to have less glass so as to deter perpetrators from easily viewing into classrooms and breaking glass to unlocking the door. Hardware locksets are to be classroom security functions, allowing teachers to lock the door without enterring the corridors.

Exterior doors have a variety of maintenance repairs and finishes. Many doors are aluminum that have failed at the hinges. Typical modifications are to install hinges to the surface of frame or door, then install metal plate to reinforce hardware mounting, etc.

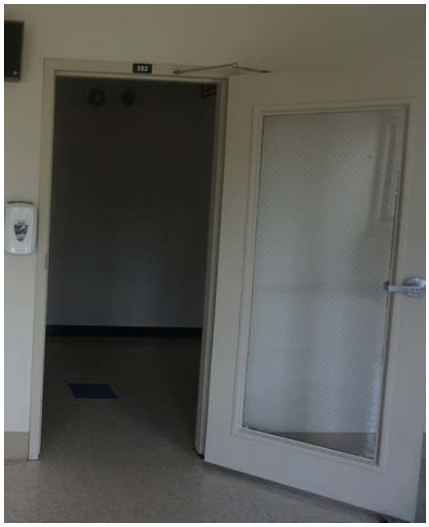
Interior doors vary and include wood doors in wood frames, wood doors in hollow metal frames, and metal doors in hollow metal frames. Hardware varies in age and quality. Some meet ADA

accessibility with lever handles while others have knob sets that do not meet code.

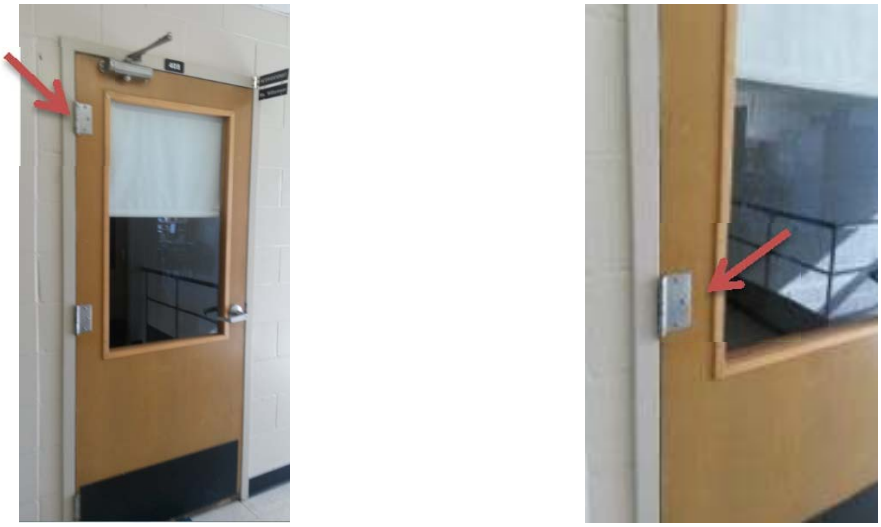
Door handle with knob

Doors vary from stained wood to painted hollow metal

Typical wood door with half glass with knob



Typical hollow metal door with full glass



Door hinges modified with face mounted hinges

Recommended classroom door

Recommendations

- All exterior and interior doors to be replaced with new doors, frames, sidelights, transom, and hardware.
- Provide fire rating assemblies as required.
- Hollow metal frames in good condition can remain.

Building Codes - General

The New Hampshire State Building Code Review Board has made revisions effective April 1, 2010. Below are the code sections that are most relevant to this analysis:

New Hampshire “fire code” or “state fire code” means the adoption by reference of the:

- Life Safety Code NFPA 101, 2009 edition
- Uniform Fire Code NFPA 1, 2009 edition

New Hampshire "building code" or "state building code" means the adoption by reference of the:

- International Building Code 2009 (IBC)
- International Existing Building Code 2009 (IEBC)
- International Plumbing Code 2009 (IPC)
- International Mechanical Code 2009 (IMC)
- International Energy Conservation Code 2009 (IECC)
- National Electric Code 2015 (NEC)

As amended by the state building code review board and ratified by the legislature in accordance with RSA 155-A: 10.

Per 155-A: 2 State Building Code.

I. All buildings, building components, and structures constructed in New Hampshire shall comply with the state building code and state fire code. The construction, design, structure, maintenance, and use of all buildings or structures to be erected and the alteration, renovation, rehabilitation, repair, removal, or demolition of all buildings and structures previously erected shall be governed by the provisions of the state building code.

II. To the extent that there is any conflict between the state building code and the state fire code, the code creating the greater degree of life safety shall take precedence.

Construction Type and Occupancy

NFPA 101 classifies the occupancy of this facility as mixed use of both:

- Existing educational: classrooms, kitchen, and offices/support spaces
- Existing assembly: multipurpose, Library and offices/support spaces. Per NFPA under Existing Educational; these spaces can be classified as Accessory Assembly, Offices and Storage.

Because the building is not fully sprinklered, the corridors that are typically part of the means of egress need to be fire rated unless adjoining a more restrictive area by code. Typical adjoining spaces are required to have fire rated separation and with a future renovation, fire rated separations will depend on the final reconfiguration of the spaces.

Fire Protection System

There is no actual automatic sprinkler system. Some areas have sprinkler heads fed off the domestic water system.

International Building Code 2009 (IBC)

Allowable Height and Building Area

On March 14, 2014 the NH Building Code Review Board voted to approve an amendment, submitted by NHBOA, to remove all New Hampshire amendments to the International Building

Code (IBC) 2009 regarding Building Height and Area Section 506.

The following reflects Chapter 5 of IBC 2009, Table 503: Building without automatic sprinkler system.

Group E – Education mixed use, Construction Type III-B. Excludes wood frame additions.

- Allowable height 2 story - MET

Group E – Education mixed use first floor footprint = 19,700 sq. ft. Construction Type III-B.

- Allowable square footage 14,500 sq. ft.

Note - We are allowed to increase building area due to street frontage by 1.75%.

- Allowable square footage 14,500 sq. ft. x 1.5 = 25,375 sq. ft. (existing first floor 21,550 sq. ft.) - MET

Recommendations

- With any future addition we would recommend consulting the Authorities Having Jurisdiction to review design options.
- Future additions will most likely require an automatic sprinkler system.

Life Safety Code NFPA 101

Estimated Occupant Load based on Table 7.1.1.2

Multipurpose – Assembly Use (existing 3,700 sq. ft.)

Assembly fixed seating 3,700 ft2 /15 = 247 occupants.

Assembly concentrated use without fixed seating 3,700 ft2 /7 = 528 occupants.

Number of Exits

Per Section 13.2.4.2 Number of Exits – Assemble - Assembly occupancies with occupant loads of 600 or fewer shall have two separate means of egress.

Presently two separate means of egress exist. There is a set of double doors leading to the exterior at Stair E and a set of double doors leading to Stair A1, leading to the exterior through Vest 100 double doors.

Assembly concentrated use requires two separate means of egress. - MET

Recommendations

- Post Maximum Occupancy load, review with local AHJ.
- Refer to 405 Ramp (egress from Multipurpose room) at the end of this report.

Arrangement of Means of Egress

Common path of travel - 15.2.5.3.2
Common path of travel shall not exceed 75 feet in a building not protected throughout by an approved, supervised automatic sprinkler system. The facility is in compliance.

Recommendations

No action is recommended.

Dead-Ends – 15.2.5.2
No dead-end corridor shall exceed 20 feet, other than in buildings protected throughout by an approved, supervised automatic sprinkler system, in which case dead-end corridors shall not exceed 50 feet. The facility is in compliance.

Recommendations

No action is recommended.

Travel Distance – 15.2.6
15.2.6.2 Travel distance to an exit shall not exceed 150 feet from any point in a building, unless otherwise permitted by 15.2.6.3 or 15.2.6.4.

15.2.6.4 Approved existing travel distances shall be permitted to continue in use.
The facility is in compliance.

Recommendations

No action is recommended.

Chapter 7 – Means of Egress, Stairs- NFPA Life Safety Code Handbook 2009

Dimensional Criteria - 7.2.2.2
7.2.2.2.1.1 Stairs shall meet the following criteria (included interior and exterior to a building):
(2) Existing stairs shall be permitted to remain in use, provided that they meet the requirements for existing stairs shown in Table 7.2.2.2.1.1 (b).

Table 7.2.2.2.1.1 (b) Existing Stairs

Minimum width clear	36 inches
Maximum height of risers	8 inches
Minimum tread depth	9 inches
Minimum head room	6 feet 8 inches
Maximum height between landings	12 feet
Landing	See 7.2.1.3 & 7.2.1.4.3.1

7.2.2.3.2 Landings.
7.2.2.3.2.2 Stairs and intermediate landings shall continue with no decrease in width along the

direction of egress travel.

NOTE (b) - Other stair requirements are dimensions of guardrails, handrails, balusters handrail extensions, etc.

Accessibility Rules and Standards - ADA

General

Please refer to Accessibility Rules and Standards – ADA towards the end of this section. Below are requirements which are similar to NFPA 2009.

505.2 Where Required. Handrails shall be provided on both sides of stairs and ramps.

505.4 Height. Top of gripping surfaces of handrails shall be 34 inches (865 mm) minimum and 38 inches (965 mm) maximum vertically above walking surfaces, stair nosing's, and ramp surfaces. Handrails shall be at a consistent height above walking surfaces, stair nosing's, and ramp surfaces.

Advisory 505.4 Heights. The requirements for stair and ramp handrails in this document are for adults. When children are the principal users in a building or facility (e.g., elementary schools), a second set of handrails at an appropriate height can assist them and aid in preventing accidents. A maximum height of 28 inches (710 mm) measured to the top of the gripping surface from the ramp surface or stair nosing is recommended for handrails designed for children. Sufficient vertical clearance between upper and lower handrails, 9 inches (230 mm) minimum, should be provided to help prevent entrapment.

505.10.2 Top Extension at Stairs. At the top of a stair flight, handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beginning directly above the first riser nosing. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

505.10.3 Bottom Extension at Stairs. At the bottom of a stair flight, handrails shall extend at the slope of the stair flight for a horizontal distance at least equal to one tread depth beyond the last riser nosing. Extension shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

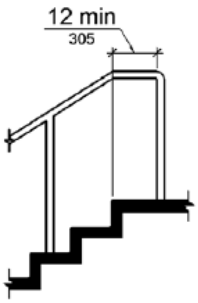
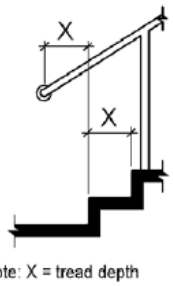


Figure 505.10.2 Top Handrail Extension at Stairs



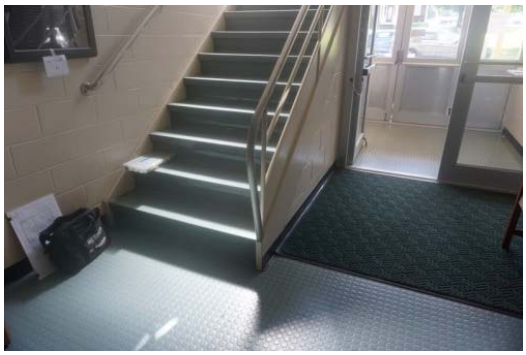
Note: X = tread depth

Figure 505.10.3 Bottom Handrail Extension at Stairs

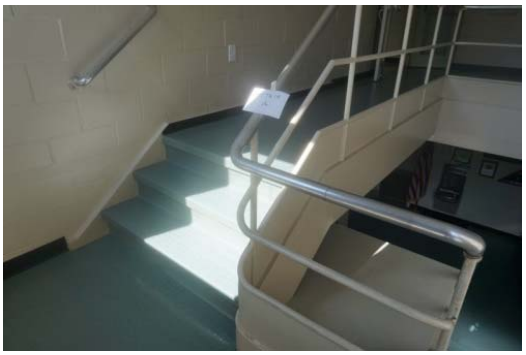
Observations

Stairs conformance to the code:

- Stair A; handrail along open stair and at landings serves as the guardrail/handrail which does not conform to code. No extension of wall handrails at bottom or top of stair runs and landings and does not conform to code. Guardrail at exterior windows does not meet height requirements or baluster spacing.
- Stair B; no handrail extensions at top and bottom run of stairs does not conform to code.
- Stair C; handrail along open stair and at landings serves as the guardrail/handrail which does not conform to code. No extension of wall handrails at bottom or top of stair runs and landings and does not conform to code. Guardrail at exterior windows does not meet height requirements or baluster spacing.
- Stair D, E, F & G; have a variety of non-code compliant issues; handrail along open stair and at landings serves as the handrail and guardrail/handrail, balusters, stair width and landing at door not meeting dimensional requirements, missing handrail, bottom riser height less than other risers, latch side of door clearance require to be 18 inches, which does not conform to code. Stairs D, E & F are precast residential style stairs not set on a concrete foundation and susceptible to frost heaving.



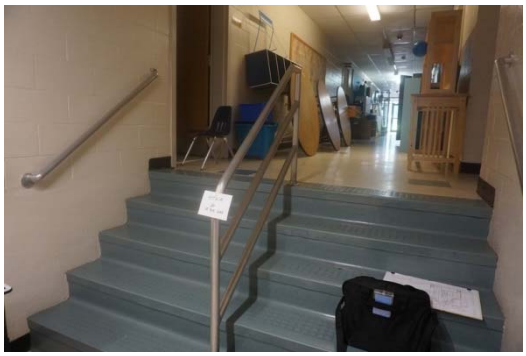
Stair A – handrail termination and guardrail/handrail along open stair does not meet code.

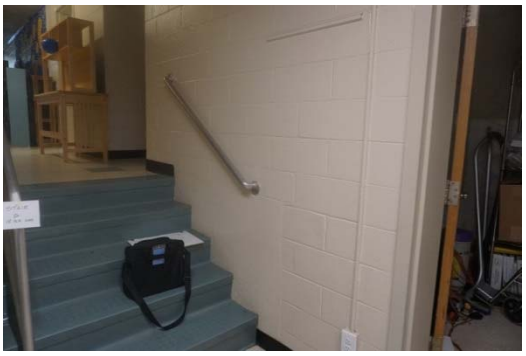


Stair A – handrail termination& guardrail/handrail at landing does not meet code.

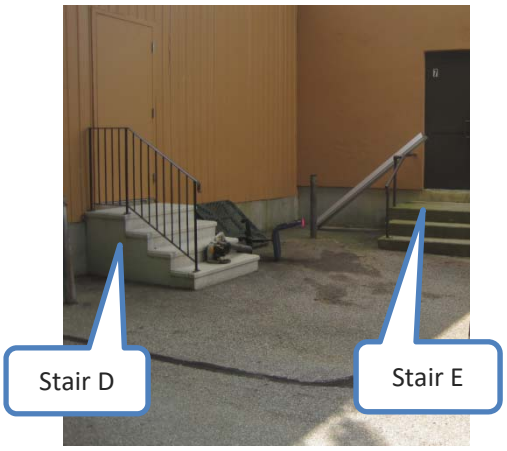
Stair A –guardrail with balusters at landing along open stair does not meet code.

Stair A – handrail termination and guardrail/handrail with balusters along open stair does not meet code.



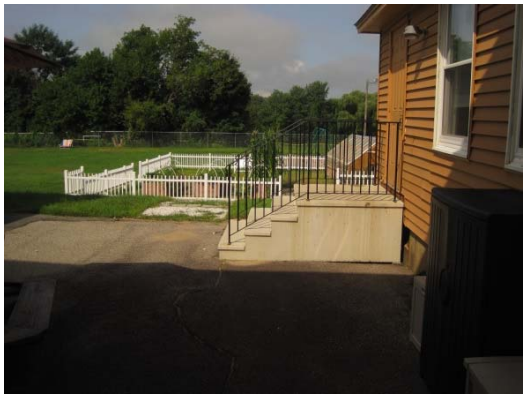


Stair B – handrail termination above and below stairs does not meet code.

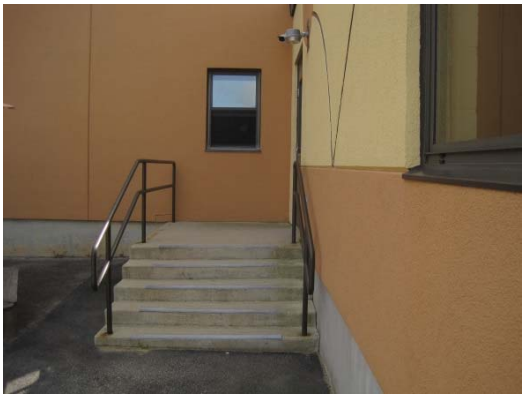


Stair D & E

Stair E



Stair F



Stair G

Stairs D, E, F & G have a variety of non-code compliant issues.

Recommendations

- Stairs A & C: along open stair and at landings to have separate handrail guardrail with balusters. Provide new wall handrails with handrail extensions. Provide guardrail with balusters to section along exterior windows.
- Stair B: provide new wall handrails with handrail extensions.
- Stairs E, F & G: provide new cast in place stairs with proper width concrete foundation below frost line.
- Stairs D, E, F & G: provide new handrail guardrail with balusters.

Egress Stairs

Egress stairs require having fire rated enclosures and lead to a public way in an enclosure of same fire rating as the stair enclosure. Stair enclosures cannot have rooms within the enclosure and cannot have storage access from the stair enclosure. A corridor is an egress access element and is allowed to access into a fire rated stair leading to a public way.

Observations

Stair A: on the first floor, Storage 133 Toilet 131 and Admin Reception 101 are within the enclosure. On the second floor Room 219 is within the enclosure.

Stair C: on the first floor, Classrooms 111 and 112 are within the enclosure. On the second floor, Classrooms 208 and 210 are within the enclosure.

Recommendations

- Stair A and C to be reviewed with local AHJ for options.
- With any future renovations and/or addition we would recommend providing an automatic sprinkler system that reduces fire ratings of stairs and building new stairs that project outward to eliminate rooms within the enclosure. Storage door to be relocate access from the multipurpose room.

Corridor Fire Separation

Corridors shall be separated from other parts of the story by walls having a minimum of 1/2-hour fire resistance rating in accordance with Section 8.3, unless otherwise permitted by the following:

(2) The following shall apply to buildings protected throughout by an approved automatic sprinkler system with valve supervision in accordance with Section 9.7.
(a) Corridor walls shall not be required to be rated, provided that such walls form smoke partitions in accordance with Section 8.4.

Note: door openings shall meet other requirement such as door closures, smoke gaskets, etc.

Observations

Presently all corridor walls are 8 inches CMU masonry concrete block which typically meets code. The original 1914, 1959 and 1987 classroom doors do not meet code. The 1999 additions do meet code.

Recommendations

- If no change in use and 1/2-hour rating can be verified, then the corridors do meet code and it appears that the facility is in compliance. No action is recommended.
- If a major renovation were undertaken, Harriman recommends providing an automatic sprinkler system. This would take advantage of reducing the 1-hour fire resistance rating to walls forming a smoke partition and rated openings.
- In either scenario listed above, Harriman recommends consulting with AHJ.
- Replace all non-conforming doors, frames and hardware or consider an automatic sprinkler system.

Corridors 15.3.6:

In existing educational occupancies the corridors shall be separated by walls having a minimum of 1/2-hour fire resistance rating. Note: if new educational occupancies occur, (if a major renovation took place would trigger this section) the corridors shall be separated by walls having a minimum of 1-hour fire resistance rating. However, if the facility were to have an automatic sprinkler system the walls shall not be required to be rated, provided that walls form a smoke partition and rated openings meet other requirements.

Recommendations

- If no change in use and 1/2-hour rating can be verified, then the corridors do meet code and it appears that the facility is in compliance. No action is recommended.
- If a major renovation were undertaken, Harriman recommends providing an automatic sprinkler system. This would take advantage of reducing the 1-hour fire resistance rating to walls forming a smoke partition and rated openings.
- In either scenario listed above, Harriman recommends consulting with AHJ.

OTHER COMMENTS

Extinguishment Requirements – Assembly (Multipurpose)

Per 13.3.5.2 any assembly occupancy used or capable of being used for exhibits or display purposes shall be protected throughout by an approved automatic sprinkler system in accordance with Section 9.7 where the exhibition or display area exceeds 15,000 sq. ft.

The present Multipurpose space is 3,700 sq. ft. which is less than 15,000 sq. ft.

MET: No automatic sprinkler system required at this time.

Windows for Rescue

Per 15.2.11.1 every room or space greater than 250 sq. ft. and used for classroom or other educational purposes shall have not less than one outside window for emergency rescue that complies with the following:

(1) Such windows shall be operational from the inside without the use of a tool with a clear opening of not less than 20 in. in width, 24 in. in height, and 5.7 sq. ft. in area.
(2) The bottom of the opening shall not be more than 44 in. above the floor, and any latching device shall be capable of being operated from not more than 54 in. above the finish floor.

Unless otherwise permitted by 15.2.11.1.2:

(1) Building protected by approved automatic sprinkler system.
(2) Where the room or space has a door leading directly to the outside of the building.

Observations

- The original 1962 and 1972 additions windows do meet code.
- The SPED 145 is 660 sq. ft. with windows that do not meet code.

International Energy Conservation Code 2009 – IECC

Section 101 Scope and General Requirements

101.4 Applicability.
101.4.1 Existing buildings: Except as specified in this chapter, this code shall not be used to require the removal, alteration or abandonment of, nor prevent the continued use and maintenance of, an existing building or building system lawfully in existence at the time of adoption of this code.

This code was adopted by New Hampshire State Building Code Review Board and revised effective April 1, 2010. The code is designed to regulate new construction and new work, and is not intended to be applied retroactively to existing buildings except where existing envelope, lighting, mechanical, or service water heating systems are specifically affected by Section 101.4.3.

This section addresses that the code does not affect existing buildings.

101.4.3 Additions, alterations, renovations or repairs.
This section simply states that new work must comply with the current requirements for new work. Any alteration or addition to an existing system involving new work is subject to the requirements of the code.

Accessibility Rules and Standards - ADA

General

Note: AB (Architectural Barrier-Free) Committee has amended the rules as they have expired. AB has adopted the 2010 ADA Standards as the AB Code. This coincides with the Department of Justice stating that as of March 15, 2012 the 2010 ADA Standards for Accessibility be used.

Below are the rules and standards that are applicable:

- 2010 ADA Standards
- 2009 International Building Code (IBC). (Accessibility scoping provisions which describe "what, where and how many". Chapter 11 "control the design and construction of facilities for accessibility to physically disabled persons".)
- 2003 ICC/ANSI A117.1-03 standards: Accessible and Usable Buildings and Facilities. (Technical requirements which describe "how".)

Please note: Due to the construction between 1962 through 1972, most portions of the building do not comply with current requirements for new construction. In many cases alterations to the portions of the building did comply at the time of the alteration. With future addition/renovations it is required to upgrade the facility depending on the extent of the proposed addition/alterations to the facility. Refer to Percent of Alterations and Cost at the end of this section.

Title II - § 35.150 Existing Facilities
http://www.ada.gov/regs2010/titleII_2010/titleII_2010_regulations.htm#a35150

The requirements of Title II of the ADA allow the public entity to provide "program access" when alterations of the facility would result in an undue burden for the public entity. This means that all services provided on the second floor of the original 1890 building must be provided on the first floor until an accessible route to the second floor is provided. There is no accessible route to the two-story section with the space that contains educational programs, offices, student services, etc. These areas contain "Primary functions".

New Construction and Alterations

35.151 New construction and alterations
(b) Alterations, (4) Path of Travel, (i) Primary functions. A "Primary functions" is a major activity for which the facility is intended. Areas that contain a primary function include, but not limited to, the dining area of a cafeteria, the meeting rooms in a conference center, as well as offices and other work areas in which the activities of the public entity using the facility are carried out.

Recommendations

To be in compliance with applicable requirements, in our judgment, is technically infeasible due to the taking of two classroom spaces out of the five existing classrooms. No action is recommended unless altered or renovated.

ICC/ANSI A117.1

Chapter 6 – Plumbing Elements and Facilities

General

The intent of ADA is to make sure that building and sites and spaces within buildings are accessible to any person with a disability. Alterations are required to make facilities compliant and accessible. However, if compliance is technically infeasible then any alterations shall comply with the maximum extent feasible. Providing equivalent accommodation when alterations are not feasible is an acceptable alternative.

Observations

The majority of the toilet rooms in the 1998 addition, Individual toilet rooms in the Kindergarten classrooms meet ADA requirements. Toilet 129A non-compliant.

Toilet rooms throughout the 1962 original building and 1972 addition are non-compliant to meet ADA requirements for size, clearances, and heights and grab bars in ADA toilet stalls.

Recommendations

- An effort for all non-compliant toilet rooms should be renovated to meet ADA requirements.
- If substantial renovation and/or additions were to proceed, then all toilet rooms that are new or modified in any way would be required to meet current codes.


Examples of ADA toilet compartments that have no rear or vertical grab bars

Girls 205 – width from toilet stalls to lavatory wall non-compliant. Similar condition in Girls 108 and Boys 115 and 213.

Typical Boys urinals – no ADA code compliant urinals. Require 1 ADA compliant per toilet room in Boys 115 & 213.

Typical Boys and Girls lavatories – no ADA code compliant lavatory. Require 1 ADA compliant per toilet room in Boys 115 & 213 and Girls

405 Ramp (egress from Multipurpose room)

Ramp slope not steeper than 1 in 12, rise shall be 30 inches maximum, with dimensional criteria for landings, ramp run, handrails, etc.

Observations

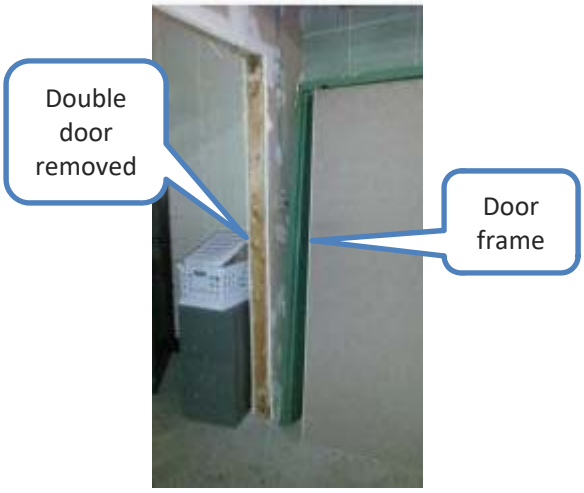
The exterior ramp from the Vestibule 139 appears to have been originally designed as an egress from the Multipurpose room to a public way. Note the trash receptors in vestibule interior view E and exterior ramp view F. It is uncertain why double doors were removed; however this creates a rated and secured egress path from Multipurpose room to a public way. In its present condition this cannot be used as a means of egress. It appears this is the route to remove trash receptacles.

Recommendations

- Re-establish Vestibule as a rated egress path with door, frame and hardware. Verify fire rating of walls. No trash receptacles should be in the path of egress.
- Limits multipurpose room with 2 egresses. Review with local AHJ and post Maximum Occupancy allowed and remove EXIT sign.
- In both cases re-build ramp with code compliant landing and handrails both sides.

A -Double door viewed from Multipurpose room
Note EXIT sign above doors.

B - Double door viewed from Vestibule 148
Note door closer disconnected.



C - Double door opening viewed from Storage 140 into Vestibule 139
Note door and frame removed and placed to the side.

D - View from Storage 140 towards door to Stair D
Note wood frame construction.

E - Double doors to exterior
Note EXIT sign above door.

F - Double doors exterior view to Vestibule 139
No landing in front of doors or handrails both sides.
If ramp were to be extended to meet code, requirement for landing would interfere with double doors from Storage 138.

Plumbing Elements and Facilities

Plumbing fixtures appear to be original to the date of construction. Refer to Mechanical/Plumbing section of this report.

Alterations

Should alterations to the facility be planned, at least 20% of the alteration budget must be applied to providing an accessible path of travel to the area(s) of primary function, unless the only alterations planned are to provide accessibility, in which case, the entire budget is dedicated to improving accessibility of the facility.

In overall alterations, where the cost to provide accessible facilities exceeds 20% of the alteration budget, Title II, Section 35.151(b)(4)(iv) provides priorities for barrier removal:

(A) When the cost of alterations necessary to make the path of travel to the altered area fully accessible is disproportionate to the cost of the overall alteration, the path of travel shall be made accessible to the extent that it can be made accessible without incurring disproportionate costs.

(B) In choosing which accessible elements to provide, priority should be given to those elements that will provide the greatest access, in the following order:
(1) An accessible entrance;

(2) An accessible route to the altered area;
(3) At least one accessible restroom for each sex or a single unisex restroom;
(4) Accessible telephones;
(5) Accessible drinking fountains; and
(6) When possible, additional accessible elements such as parking, storage and alarms.

Alterations must be completed in compliance with the ADA Standards for Accessible Design (ADA Std.) per ADA Title II, § 35.151 New construction and alterations http://www.ada.gov/regs2010/titleII_2010/titleII_2010_regulations.htm#a35151.

ADA Standards for Existing Buildings and Facilities
http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm#pgfId-1010052

ALLENSTOWN ELEMENTARY SCHOOL - FACILITY ANALYSIS

STRUCTURAL

Existing Structural System - General

When evaluating an existing building structure, the structural system is investigated to identify areas of damage or deterioration as well as confirm that the as-built condition of the structural components are adequate to support the loads prescribed at the time of original construction. In accordance with the 2015 International Existing Building Code, it is not specified that the building's structural system be capable of supporting current building code requirements unless renovations, alternations, or additions are included that will alter the loading conditions or magnitudes.

For wind and seismic loading, the 2015 IBC identifies wind and seismic forces to be resisted by the structural framing system. These forces are determined through consideration of numerous criteria related to soil type, exposure, height, and structural system. It is noted that while current code recommendations for wind and seismic effects are more stringent than at the time this building was designed and constructed, the 2015 International Existing Building Code does not require structural upgrades to an existing building unless an addition, alteration (such as an increase in roof insulation) or change of use prompts or causes an increase in loads. Should significant structural renovations be made which affect the lateral force resisting system, seismic upgrades would be required. Further detailed and specific analysis would be necessary to evaluate the impact and design necessary reinforcements.

Structural drawings were not available and would require extensive investigation. We recommend reserving our efforts to when the School District determines a direction on which school would be considered for consolidation and at what portion an addition would be recommended.

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ALLENSTOWN ELEMENTARY SCHOOL - FACILITY ANALYSIS

FIRE PROTECTION

General

There is no sprinkler system in the Allenstown Elementary School. If an addition is to be added or significant renovations were to occur, a fully automatic sprinkler system would be required. The existing 2” water service entrance could not support a sprinkler system and a new 6” minimum water entrance would be needed.

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ALLENSTOWN ELEMENTARY SCHOOL - FACILITY ANALYSIS

PLUMBING

General

The basic plumbing systems that were reviewed consisted of:

- Domestic hot water heating
- Water service
- Drainage and domestic water piping condition
- Plumbing fixtures

Plumbing System

Domestic hot water is generated by two Lochinvar natural gas boilers. Each boiler has an input capacity of 500,000 btuh. Boiler water heated to 160°f is circulated through an HTP 80 gallon indirect fired storage tank through a Taco circulating pump. The pump is controlled by a temperature probe in the storage tank. The tank and boilers were installed in 2012. The tank is in good condition. The tanks maintains between 140°f and 150°f. The stored water is reduced to a lower temperature through a thermostatic mixing valve before being distributed to the building.

Existing Indirect Fired Water Storage Tank

The boiler system, and therefore the storage tank, is turned off in the summer. Currently there is no hot water backup for the summer months when school is in recess. The domestic hot water system has a small Taco circulator pump to maintain hot water in the piping. There is a hot water return circulating loop through the building, but it suspected to not be working properly. Complaints of waiting for hot water were reported especially in the kitchen. Perhaps this condition only occurs during the summer months when the boiler is turned off.

Existing Thermostatic Mixing Valve

Existing Symmons Thermostatic Mixing Valve

The water service entrance consists of a 2" copper supply through the floor in the boiler room. There is an original 2" gate valve and a more recent 2" ball valve upstream of the water meter. The water meter is 2" with a remote reader. A 2" reduced pressure zone backflow preventer is installed downstream of the water meter. Water is delivered to the building through a 2" pressure regulating valve at 75 psi.

Existing 2" Water Entrance Valves

Existing 2" Water Meter

Existing WATTS 009 Reduced Pressure Zone Backflow Preventer

Existing Pressure Regulating Valve Set to 75 PSI

Building Water Pressure Gauge

Plumbing fixtures appear to be in good condition. The toilet fixtures are modern design, but not water conserving models. Water conserving models have been a requirement since 1991. Water conserving models use 1.6 gallons or less per flush. The existing fixtures use 3.5 gallons per flush. The lavatories are modern design with single push button metering faucets. The metering faucets are designed to run for approximately 15 seconds per cycle. Some faucets would not stay on after pushing the button. The urinals are a modern design and use 1 gallon per flush.

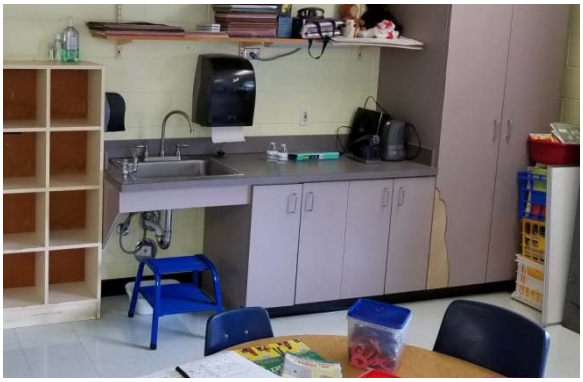
Typical Toilet

Typical Lavatories with Metering Faucets

Typical Urinals

Most classrooms have a stainless steel sink in a cabinet with a faucet. Several sinks are accompanied by a bubbler spout and bowl. The counters, sinks and bubbler heights are higher than suggested for elementary schools. Lower grades require a step stool to reach the sink and controls.

Typical Classroom Sink with Bubbler



Classroom Sink with Step Stool

The kitchen has an on-floor grease interceptor to collect waste from the two wash bowls of the three bay sink. The sanitizing bay is drained indirectly to a sanitary receptor. The dishwasher drains directly to the sewer. There are no gas fired appliances in the kitchen. The dishwasher has an external electric booster heater to provide 180°f rinse water for sanitizing. All items in the kitchen appear to be in compliance with codes. All fixtures appear to be in good working order. Hot water delivery could not be evaluated because the boilers were turned off and no hot water was available.

3 Bay Sink and Dishwasher Drainage Piping

Hand Sink and Grease Interceptor in Kitchen

Pot Wash and Dishwasher

The drainage and vent piping consists of cast iron with hub and spigot joints and fittings. The interior condition of the piping is unknown. Typically cast iron in a commercial installation has a lifespan of 50 to 75 years. The piping condition can be evaluated with a camera inserted into the piping. The domestic water piping is copper tube with soldered joints and fittings. Solder used in plumbing systems prior to 1986 contained 50% lead, 50% tin. Since 1986 lead solder is not allowed to be used in drinking water systems. It is recommended piping with lead solder be flushed prior to drinking.

Examples of Cast Iron Piping

Recommendations

- The indirect fired water heater should be removed and replaced with a high efficiency gas fired water heater. The stand-alone water heater would provide hot water year-round. A suggested water heater would be similar to HTP Phoenix 120 gallon storage with 199,000 btuh input.
- Replace all restroom plumbing fixtures with water conserving models with new flush valves and faucets.
- Replace all classroom sinks with ADA child height fixtures. Mount the counters and sinks at 31” above finished floor with knee space below.
- Provide a single user restroom in each Pre-K and Kindergarten classroom. The fixtures would be mounted with the toilet seat height at 15” and the lavatory at 31” above finished floor.

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ALLENSTOWN ELEMENTARY SCHOOL - FACILITY ANALYSIS

MECHANICAL

General

The basic mechanical systems that were reviewed consisted of:

- boiler plant
- heating distribution
- temperature control
- air moving
- classroom heating and ventilating
- heating terminal units
- local air conditioning units

Mechanical System

The main boiler plant consists of two Lochinvar Knight XL boilers. Each natural gas boiler has an input of 500,000 BTUs with a max output of 470,000 BTUs. A dedicated circulation pump operates in unison with its respective boiler to inject hot water through a closed spaced tee into the central heating loop. A majority of the piping in the boiler room is uninsulated.

Typical Boiler

Closed space tee and example of uninsulated pipe

Main supply and return headers located in the boiler room are connected to individual zone pumps which circulate hot water to 11 different zones located throughout the building.

Zone Pumps

Existing building controls are pneumatic with the central air compressor located in the boiler room.

Controls Air Compressor

Typical classrooms in the 1962 and 1972 portions consist of perimeter fin tube for heat and a small amount of exhaust which provides minimal, indirect ventilation that does not meet current codes.

Kindergarten classrooms in the 1998 expansion are heated and ventilated. Unit ventilators are ceiling mounted and draw fresh air in through roof mounted intake hoods and relieve air through similar hoods on the roof. Additional heat is provided with perimeter fin tube.

Typical Kindergarten Unit Ventilator

The multipurpose room is heated with vertical discharge unit heaters. A wall mounted exterior exhaust fan provides minimal ventilation by exhausting the space.

The kitchen contains a 10 burner range and oven which is located under a hood. A portion of the kitchen hood exhaust duct is constructed of galvanized steel. This does not meet code which requires carbon welded steel. A stacked convection oven located adjacent to the range is not located under a hood. These types of ovens are typically located under hoods to remove heat.

Kitchen Cooking Equipment

The only rooms that are air conditioned are the reception area and principal's office. Cooling is achieved with a ductless split system consisting of wall mounted evaporators in each room and a single condensing unit located on the roof overhang outside.

Condensing Unit

Evaporator

The data closet does not have any means to cool and it was observed that the door was left open.

Many single use toilets are exhausted with dedicated ceiling exhaust fans that are ducted to the outside. Multi-use restrooms are exhausted through the central exhaust fans that serve the classroom.

Other miscellaneous systems include cabinet unit heaters for entry doors and unit heaters for storage rooms. The SPED rooms are heated with electrical baseboard and electric unit heaters.

Recommendations

Ventilation

The school lacks proper ventilation that meets current ASHRAE 62.1-2016 which requires 10 cfm of outdoor air per person plus 0.12 cfm per sqft for a classroom. For a typical classroom with 25 students and a teacher, this will result in approximately 375 cfm. Since rooms are heated with perimeter fin tube, a dedicated outdoor air system (DOAS) is recommended to provide 100 percent outdoor air. The DOAS unit will consist of a supply fan, exhaust fan, hot water heating coil, and either a flat plate or rotating wheel sensible heat recovery module. Air would be delivered to the spaces at neutral temperature to minimize the heating needed from the perimeter fin tube. On a design heating day, the discharge air temperature at the heat recovery module will be approximately 40 degrees. This will require a heating coil to temper the air up to a neutral temperature of 70 degrees.

Heating Plant and Distribution

The boiler plant is at capacity or near maximum capacity to heat the building. The system lacks redundancy which would prevent the building from maintaining set point should a boiler fail. The remaining boiler may struggle to heat the building on a design heating day when average temperatures are at their lowest. The addition of any ventilation systems would add to the heating demand on the school. Any plans for future expansion would also exceed the capacity of the existing boiler plant. At a minimum, a third boiler should be added to provide some redundancy. The size of the boiler will depend on implementation of ventilation systems and future expansion.

The 11 individual zone pumps also contribute to the lack of overall redundancy in the system. Should a particular zone pump fail, the associated zone will not be able to maintain set point. The individual pumps could be replaced with a central pump system which consists of two hot water pumps. Each pump will have the capacity to provide water flow to the entire system and will be arranged in a lead/standby arrangement. Only one pump will run at time and will switch operation on a weekly basis. Should one pump fail, the other pump will be commanded on. Pump speed will be controlled through a variable frequency drive which will vary the pump speed based on differential pressure. As valves open and close in the building, the pump will adjust its speed.

Pipes that are uninsulated in the boiler room should be insulated with PVC covers and labeled as “ASBESTOS FREE”.

Cooling

A ductless split air conditioning unit should be provided for the data room in either its current or future location. A unit that requires cooling throughout the year shall be capable of low ambient operation.

If cooling is desired for the entire school then rooms such as classrooms and smaller should be connected to a central variable refrigerant flow system. This will consist of either wall mounted or ceiling cassette evaporators with condensing unit clusters strategically located on the roof. If large spaces are to be cooled such as the multi-purpose room, a central air handler should be size with heating and cooling coils to provide heating, cooling, and ventilation.

Kitchen

At a minimum, the kitchen hood exhaust ducts should be replaced and installed in accordance with NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

Any alterations to the kitchen involving cooking equipment should include the upgrade of exhaust hoods and fire extinguishing system.

Controls

Pneumatic controls should be removed and replaced with direct digital controls which allow users to access a graphical user interface from any location with the proper credentials.

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ELECTRICAL FACILITY ANALYSIS

Service Entrance and Power Distribution

Observations

The electrical provider for this site is Eversource. The service entrance is served by three 25kVA, pole mounted transformers located on the opposite side of Main Street from the school building. The 25kVA transformers have a full load rating of about 67.5kW @ .9pf (208 amps at 208 volt, three-phase). Information provided by Eversource indicates that the peak demand measured on January 16, 2017 was 57.2kW (about 159 amps @ 208 volt, three-phase).

pole mounted transformers serving building

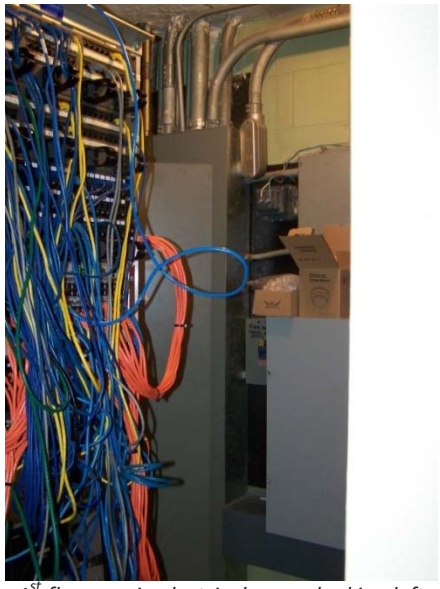
The service disconnect (fused disconnect switch) is located in a first floor storage closet. It is difficult to tell if the service entrance feeders terminate on the service disconnect immediately upon entering the building. The service disconnect was found unlocked. The switch can be opened without tools, exposing energized parts.

service disconnect

service disconnect, close view

The meter and main panelboard is located in a first floor electrical room (located ½ story above the storage room housing the service disconnect). There appears to be additional circuit breakers tapped off ahead of the main panelboard. The main panelboard is 400amp, 208V, 3ph/4w panelboard with 400amp main circuit breaker. The main panel board is a Square-D load center that appears to be in good shape. Parts and circuit breakers are still available from Square-D for this equipment. The utility company meter is located in the main electrical room. This room shares space with a communications rack that impedes working clearances.

1st floor, main electrical room, looking left



1st floor, main electrical room, looking left

1st floor, main electrical room, looking straight back

1st floor, main electrical room, looking right

There is a generator connection box located on the building exterior at the boiler room exterior door. The transfer switch is located in a first floor storage room adjacent to the service disconnect. The switch has a 400amp rating at 240V. Stored items impede in the working clearances.

generator connection box

manual transfer switch left side, stored items impede working clearance

manual transfer switch

manual transfer switch, close view

Panelboards downstream of the main panelboard are not located in electrical rooms. Most are located in corridors, with some in areas such as the kitchen or boiler room. Most panelboards are older and beyond their expected useful life expectancy. Circuit breakers become difficult and sometimes impossible to find when needed.

kitchen panelboard #1, recessed, no space remaining and panel cover does not sit tight to wall

kitchen panelboard #2, surface, space remaining for additional circuit breakers

kitchen panelboard, newer panelboard, space remaining for additional circuit breakers, improper filler pieces, exposed parts and appears that a circuit breaker that is not intended for this panelboard installed

corridor panelboard

240V/1ph panelboard located in an office in the vicinity of the kindergarten classrooms

boiler room panelboard with storage impeding access

Recommendations

The peak demand as measured by Eversource indicates that there is about 10kW (28 amps @ 208 volt, three phase) of available capacity on the Utility side of the service. There is adequate capacity in the 400 amp main panelboard to support about 58kW (161 amps @ 208 volt, three phase).

However, the service is not adequate to accommodate the additional ventilation requirements of the building once renovated.

In order to accommodate a renovation the service will be required to be increased in capacity. An 800 amp service at 208V volt, three phase will be required. The upgraded service will require floor space be taken from another location in the building. Due to the size of the existing space and location of the communications rack, there is not enough space to accommodate a new service in the existing location.

- The service entrance disconnect should be locked shut to keep unauthorized people from opening the witch and exposing themselves to the energized components of the switch.
- Code required working clearances do not exist. Either the electrical equipment or communications equipment will have to be relocated.
- Panelboards that are 30 years old or older should be considered for replacement. Expected useful life expectancy is around 30 years.
- Panelboards with incorrect circuit breakers (kitchen panelboard) should be replaced for safety reasons.
- Circuits should be traced to update panelboard directories with accurate, legible, typed directory cards.

Branch Wiring and Circuits

Observations

No panelboards were opened however, wiring with cloth insulation, non-metallic sheathed (Romex) and MC cable were observed above ceilings and in the main electrical room.

cloth insulated wiring

non-metallic sheathed cable – Romex, first floor janitors closet

above ceiling first floor, shows wire in conduit, non-metallic sheathed and MC cable

Due to the concrete block construction of the building, there is a lot of surface mounted raceway installed throughout.

surface mounted raceway in typical classroom

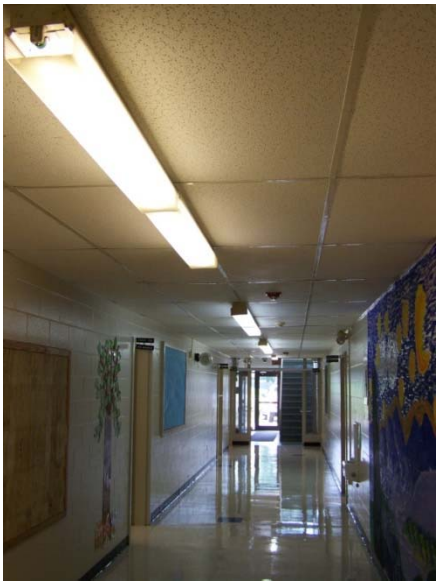
Recommendations

- Non-metallic sheathed cables are not permitted in a structure of this construction type (type II). All non-metallic sheathed cable should be replaced with MC.
- Replace receptacles with "Tamper Resistant" type. Use of these receptacles is now a requirement of the 2017 National Electrical Code in preschool and elementary school facilities.

Lighting and Lighting Controls

Observations

Interior building lighting is primarily accomplished with the use of surface mounted fluorescent lighting; the kindergarten wing uses primarily recessed fluorescent troffers. There are still a few incandescent lights and a few LED replacement fixtures in the building.



typical corridor lighting

typical classroom lighting

another example of typical classroom lighting

kindergarten wing utilizes recessed troffers

incandescent lighting fixture, main electrical room

upgraded LED corridor lighting, near main office

Lighting in the gymnasium / cafeteria is accomplished with four lamp fluorescent high bay fixtures.

gymnasium / cafeteria lighting

gymnasium/cafeteria lighting, close view

Some classrooms have wall mounted fixtures along one wall. It appears that the use of these fixtures has been discontinued and they have had their lamps removed.

wall mounted classroom lighting fixture with lamps removed

There are numerous locations where lighting fixtures have had walls built around them, with the lighting fixture runs running through the walls making the fixtures unmaintainable. This prohibits the ability to maintain the fixture.

wall built around lighting fixture run

another example of wall built around lighting fixture run

discolored lenses, appears to be discolored from water

Exterior lighting is primarily accomplished from the building or from wood utility poles. None of the lighting is cut off, so lighting spills above the horizon. There is little security lighting around the rear of the building; lighting from the building is located on the front and left side. Pole mounted lighting appears to be leased utility company lights.

building mounted lighting at main entrance

building mounted lighting at left side of building

pole mounted flood lighting, utility company leased lights, right side of building

pole mounted flood lighting, utility company leased lights to ball fields, right side of building

Lighting control is provided with local toggle switches only. Corridors and exterior lighting are controlled via a relay system with switches located in the main office. With the exception of the gymnasium, no automatic controls were observed (occupancy sensors or lighting control systems). Each gymnasium lighting fixture has an integral occupancy sensor that turns the lighting fixture on when occupancy is detected and turns the fixture off when occupancy is not detected for a set duration.

typical classroom switch arrangement

corridor and exterior lighting control station at main office

Recommendations

- Remove lighting fixtures that are no longer in use and run through walls.
- Upgrade lighting with LED for both interior and exterior lighting fixtures.
- LED lighting fixtures are amiable with 0-10V dimming as a standard option so each office and classroom should be provided with dimming.
- Energy codes require automatic lighting control for most lighting fixtures:
  - Provide centralized low-voltage lighting control relay system for common area lighting (corridors, vestibules and lobbies) and exterior lighting. This system allows programmed scheduling, photocell control, and occupant override of lighting.
  - Provide local occupancy sensing controls in rooms (offices and classrooms) that automatically turn lighting "OFF" when the space becomes un-occupied for 30 minutes. Each space would be provided with a 0-10V dimmer switch to allow occupant control "override" of the room lighting.
  - Spaces where safety may be a concern (kitchen and mechanical spaces) do not require automatic lighting controls. In these spaces standard toggle type ("ON" / "OFF") switching is recommended.

Emergency Egress / Life-Safety Lighting

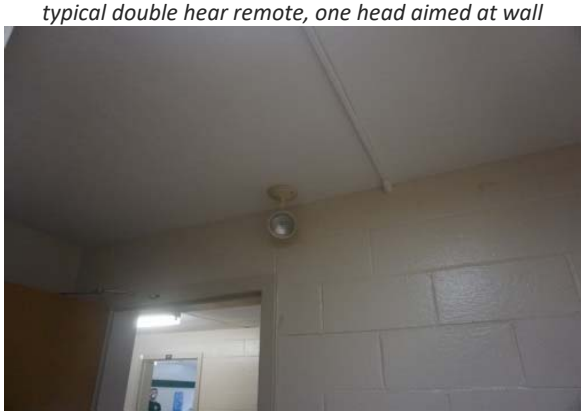
Observations:

Emergency egress / life-safety lighting is provided throughout the building via emergency battery units with remote heads. A battery unit was observed plugged into a receptacle; not monitoring the lighting circuit of the area it is protecting. A number of locations are covered by a single lamp remote head. NFPA101, 7.8 (Illumination of Means of Egress) requires that the failure of any single lighting unit does not reduce the lighting level below 0.2fc. Location of the heads does not provide adequate coverage to give the required average fc level of 1.0fc. There is no emergency egress / life-safety lighting on the building's exterior at egress doors.

emergency egress / life-safety battery unit plugged in a receptacle, main electrical room

typical emergency egress / life-safety battery unit, this unit has a single head attached

typical double hear remote, one head aimed at wall



typical single head remote, does not meet NFPA 101 in most cases

Recommendations

- Replace existing emergency egress / life-safety lighting battery units with new.
- Each battery unit to be powered from and monitor the local lighting circuit of the area the unit serves to meet code.
- Provide denser spacing to provide the code required lighting levels and redundancy.

Fire Alarm System

Observations

The fire alarm system is by Mircom. The fire alarm control panel is a FX-2000 (zoned fire alarm system).

The system does not comply with code:

1. There is no notification in classrooms.
2. There is no voice evacuation in the building.
3. Smoke detectors are not located within five feet of doors on hold opens.

The building is not sprinkled. Heat/smoke detectors have been located in most, but not all spaces. Detectors are not located within 5 feet of doors on hold opens. The fire alarm system reports to a city loop via a master box located adjacent to the main entrance. Connection from the master box to the city loop is by aerial cable run to a utility pole located on the opposite side of Main Street from the school building.

fire alarm system master box, reporting device to the city loop

fire alarm control panel located in the main office

typical ceiling mounted fire alarm strobe

style of fire alarm appliances in the building vary

style of fire alarm appliances in the building vary, wall mounted

fire alarm system remote annunciator

building fire alarm connection to the city loop

Recommendations

- Replace the existing fire alarm system with new system that provides voice evacuation throughout the building to comply with code.
- Provide notification in classrooms to comply with code.
- Provide smoke detection to comply with code.

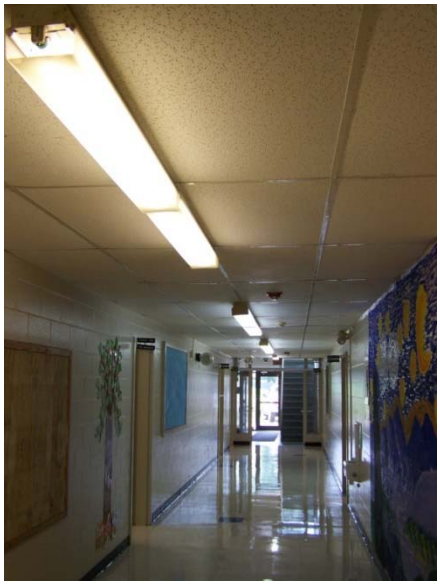
Exit Signage

Observations

Exit signs exist throughout however; there are locations where two signs cannot be seen due to the different floor heights. In some corridor locations view of the exit sign is partially blocked due to surface mounted lighting fixtures. Exit signs in a major portion of the building (except kindergarten wing) are old and difficult to tell if some are illuminated.

typical exit sign in all but kindergarten wing

no exit sign in view due to difference in floor elevations



exit sign partially block by surface mounted lighting fixtures

typical exit sign in kindergarten wing

Recommendations

- Replace existing exit signs and add signs where required to adequately provide direction to egress openings; relocate as necessary so they are not blocked by surface mounted lighting fixtures.
- Provide LED exit signs for reduced maintenance and evenly illuminated face.

Communications Systems

Observations

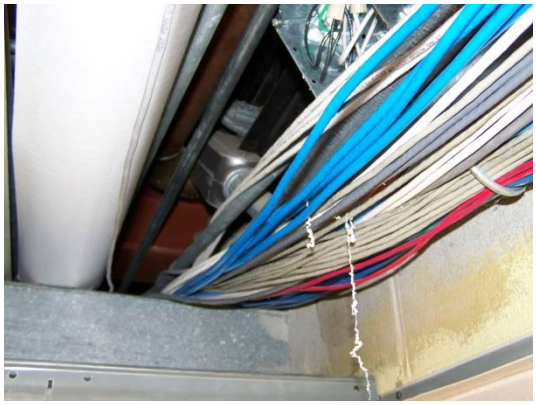
Communications serve the building via overhead lines from a utility pole on the opposite side of Main Street from the building. The communications demarcation appears to be in a custodial office that connects the boiler room to the first floor main corridor. There is one communications rack serving the building. The rack is located in the main electrical room and impedes on the required electrical equipment working clearances. This also gives very little clearance to work and maintain the communications equipment. Data drops are distributed throughout the building. Each classroom had a number of jacks and a wall phone located next to the door. There were a number of wireless access points throughout. The system appears to be a CAT 5e system.

When observing the cables run above the first floor ceiling, it was noted that space is limited. Some of the cables are supported independently from the ceiling and some are not. Harriman was unable to observe wall penetrations to see if the rating of walls has been compromised from cable penetrations.

demarcation in custodial office between the boiler room and first floor main corridor

communications rack in main electrical room, inadequate working clearances

typical classroom, phone at door



cables above first floor corridor ceiling

Recommendations

- If the electrical equipment is to remain in its current location, the communications rack requires relocation. This will require rewiring many of the existing data jacks.
- If the electrical service is upgraded and relocated, this room can remain as a communications room. Cooling of the room should be provided.

Instructional Technology

Observations

Every classroom utilizes a voice reinforcement system by Lightspeed Technologies Inc. Every classroom utilizes interactive projector/boards. There are a variety of products being utilized.

classroom sounds reinforcement system

classroom interactive projector/board

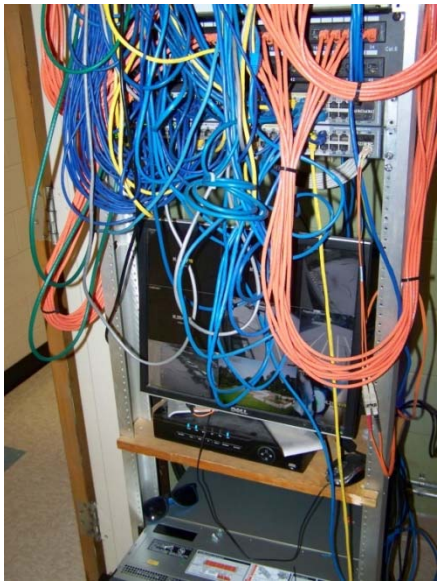
Recommendations

- Maintain sound reinforcement systems in all teaching spaces.
- Add interactive teaching devices to any space that does not currently have any; upgrade oldest devices.

CCTV System

Observations

The head end of the CCTV system resides on the communication system rack that is located in the main electrical room. The system appears to have been installed recently and appears to have adequate coverage, both on the interior and exterior of the building.



CCTV system head end and monitor in communications rack

typical interior camera

Recommendations

- Review coverage, re-aim cameras as/if needed for better coverage, add cameras as/if needed.

Public Address System

Observations

The public address system is by Bogen. It is a zoned system that requires each zone be hard wired back to the head end equipment. The head end equipment is located in the main office. The system appears to be is good shape with space to add approximately thirty additional zones.

public address system head end equipment

typical classroom speaker and call button

typical recessed speaker, non-classroom locations

typical wall mounted speaker, used in some corridors

Recommendations

- If administration/secretary location is relocated, all zones will have to be re-run to the new location.
- If administration/secretary location remains, no work is required.

Intrusion Detection System

Observations

There is an intrusion detection system in the building. Common areas are covered by motion sensors with key pad located at the main entrance/admin area. Cabling to some devices is not protected. They are run through ceilings and over door frames.

intrusion detection system key pad at main entrance

intrusion detection system motion sensor with cabling hanging in space

Recommendations

- Expand the system to monitor the position of all exterior doors with magnetic switches.

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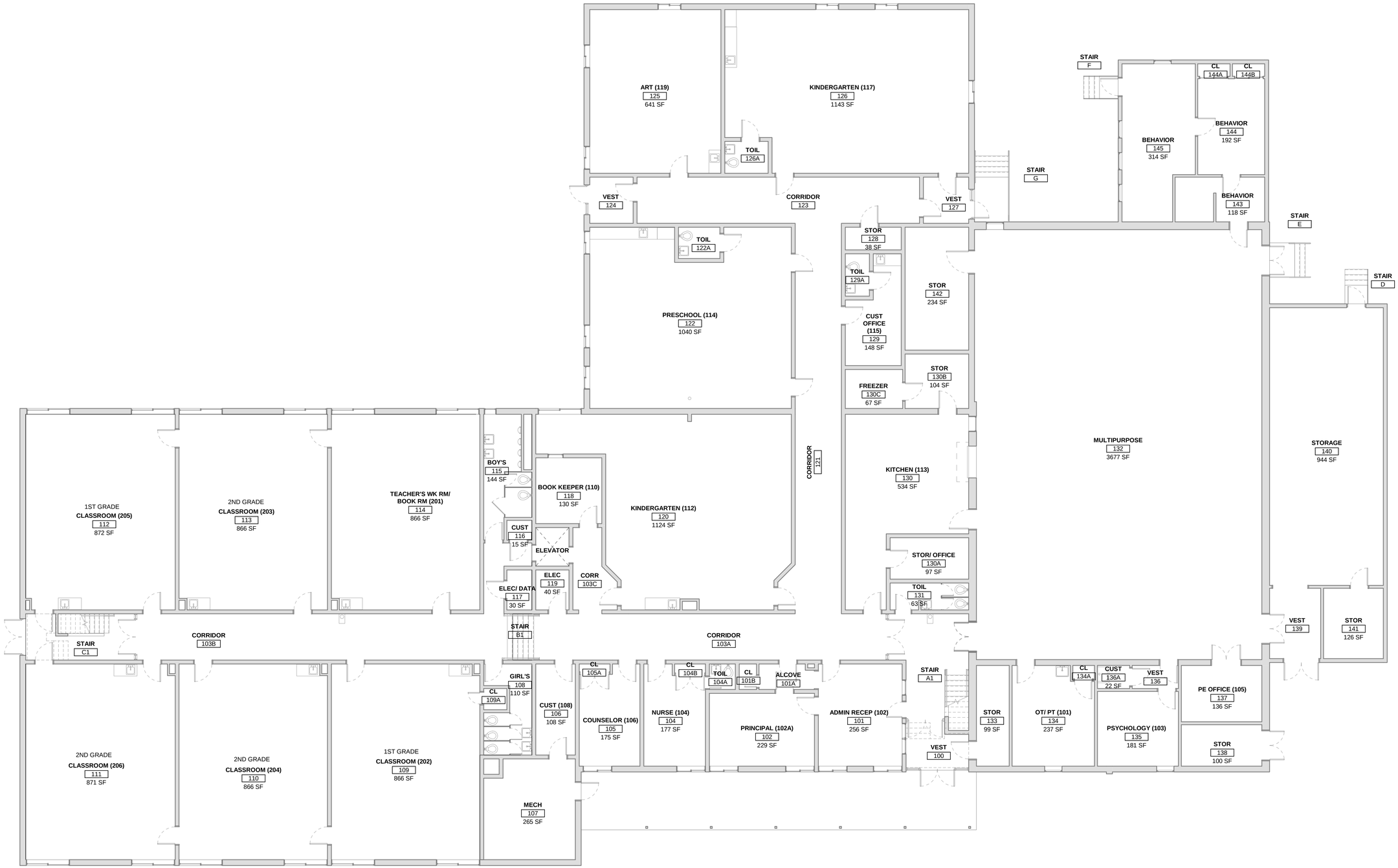

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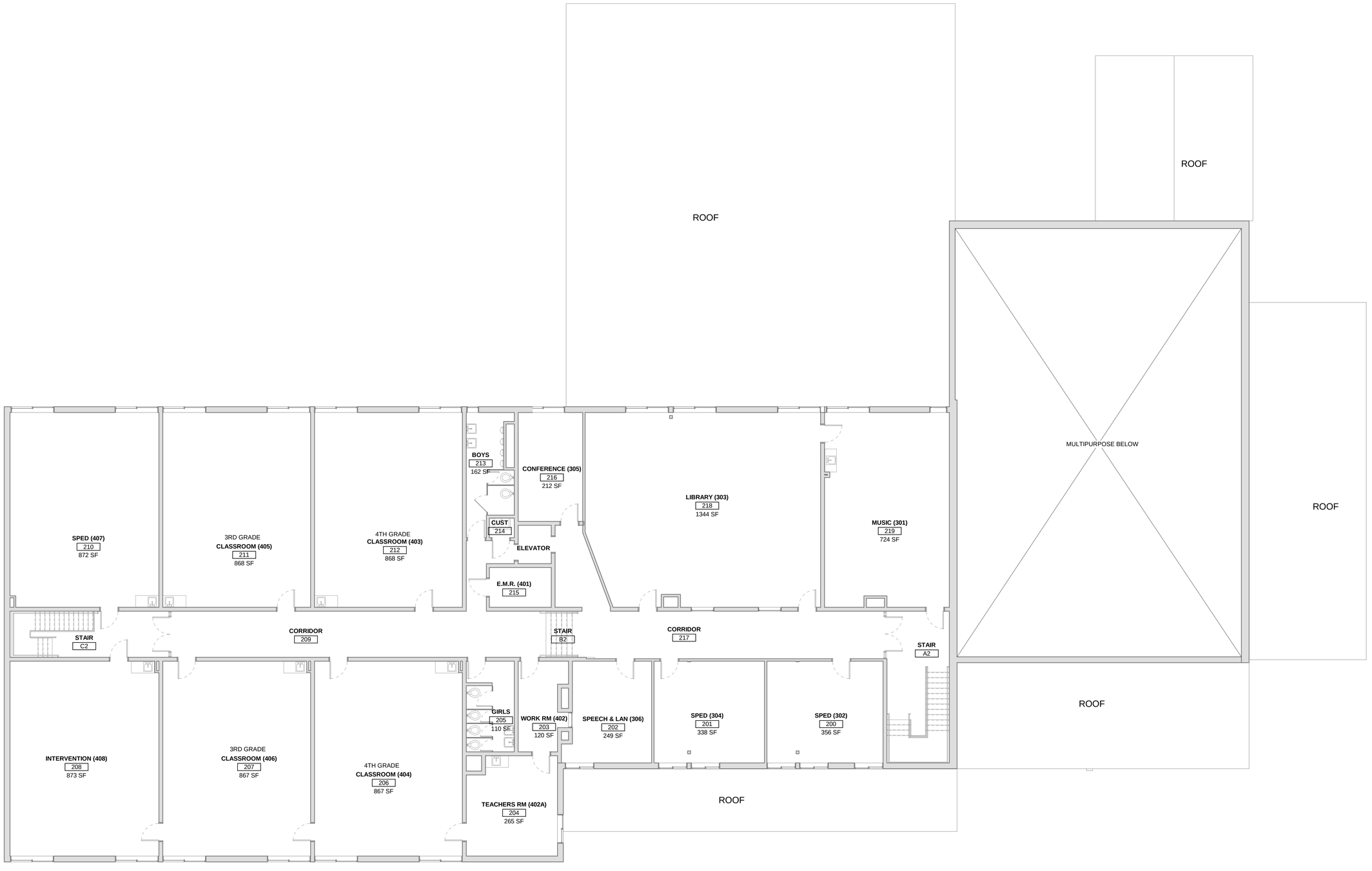
ALLENSTOWN ELEMENTARY SCHOOL

HA: 18345

EXISTING FIRST FLOOR PLAN

FEB 22, 2019



ALLENSTOWN ELEMENTARY SCHOOL

EXISTING SECOND FLOOR PLAN

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